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EDITORIAL.

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ANATOMO-PATHOLOGICAL DIAGNOSIS OF RABIES.—This very important question was discussed in the second section of the Ninth International Veterinary Congress of The Hague and among the reporters were pathologists of high renown: Dr. L. Frothingham, of Boston; Dr. van Gehuchten and Nelis, of Belgium; Dr. R. Hartl, of Austria; Dr. E. de Ratz, of Budapest, and Prof. Grabowski, of Austria. Two of the reports were, I believe, the only ones presented. Prof. E. de Ratz in his, passed a general review of all the researches and discoveries that have been made by Babes, Marx, Dezler, Remlinger, L. Nocard, van Gehuchten, Nelis and others and finally of those of Negri and concluded in giving new evidences of the great diagnostic value of the presence of the bodies of Negri.

Prof. Frothingham was more in the spirit of the question, and his conclusions, that I reprint, are undoubtedly of great weight in confirming also the value of the discovery of Negri's bodies, but also offering the results of his researches in relation to the lesions of the Gasserian ganglia. These conclusions are interesting:

1. The most rapid and satisfactory, and, at the same time, accurate method of demonstrating Negri bodies is by impression preparations stained according to Van Giesen.

2. The presence of Negri bodies is diagnostic of rabies, and when found, animal inoculations are unnecessary.

3. A diagnosis of rabies must only be made upon the finding of true bodies of good color, shape and internal structure, and such bodies must be found within the nerve cell. Doubtful bodies outside the nerve cell may be artifacts.

4. Negri bodies may be found in one portion of the brain and not in another, or they may not be found at all, and in such cases a rapid diagnosis may be made by the presence of lesions of the ganglia.

From the study of about seven hundred Gasserian ganglia, I believe that the following conclusions are justified:

1. In rabies the Gasserian ganglia usually show lesions which may be of two kinds, viz.:

(a) The typical or focal lesion characterized by the partial or complete destruction of the ganglion cell, its place being occupied by cells of the endothelial type, thus forming a focus suggestive of a tubercle. Such foci may consist almost entirely of cells of the endothelial type, but often associated with them are mast cells, lymphocytes, plasma and connective tissue cells and polymorphonuclear leucocytes; in other words, the cells of a chronic inflammatory process. Probably such lesions arise by primary necrosis of the ganglionic cell with subsequent invasion and digestion of its cytoplasm by the invading cells, not by stimulation proliferation of the capsular cells, and subsequent destruction of the ganglion cell.

(b) The atypical or diffuse lesion characterized by a more or less general infiltration, between the ganglion cells and nerve fibres of the organ of endothelial, and the diverse cells which we associate with chronic inflammatory processes. This lesion is usually associated with the typical lesion, even where changes are comparatively slight, sometimes one form predominating and sometimes the other.

2. The lesions above mentioned may be very extensive, involving the whole ganglion, or they may be so slight that they are seen only in an isolated ganglion cell here and there, and in order to find such a focus one may have to examine twenty to thirty sections of both ganglia.

3. Lesions may be present in one Gasserian ganglion and not in the other.

4. Since in a small per cent. of cases such slight changes only occur, and also may be present in only one of the two ganglia, serial sections of both ganglia should be made (mounted close together in paraffine then cut as one section) and the tissue should be fixed by a method which insures perfect preservation of the cells, and the stain should bring out these cells to the best advantage. I have succeeded best with *Zenker's* fluid and *Mal-lory's* methylene blue and eosin stain.

5. Very rarely no lesion can be found by following the just mentioned method and carefully examining from twenty to thirty sections, although the animals from which these ganglia were taken were proved rabid by inoculations, or the presence of Negri's bodies or both.

6. Very rarely extensive typical lesions are found involving much of the ganglia, and yet intracerebral inoculations of a rabbit and guinea-pig prove negative.

7. The Gasserian ganglia from many animals that are not rabid are not normal, the lesions sometimes being so confusing as to lead one to strongly suspect rabies, yet Negri bodies and inoculations are negative.

8. Isolated focal lesions are occasionally found which cannot be distinguished from the true typical lesions, yet intracerebral inoculation of a rabbit and guinea-pig prove negative.

9. Focal lesions, usually about small blood vessels, are found in the Gasserian ganglia of animals that are not rabid (infiltration of lymphoid and other cells) and such lesions alone probably have nothing to do with rabies.

10. Consequently, lesions in the Gasserian ganglia cannot be considered specific of rabies, nor can their absence exclude the possibility of the disease. The percentage of error, however, is so small that one is justified in expressing an opinion based on the lesions found when other means of diagnosis are impossible.

On this same interesting subject I gather from the *Bulletin of the Société Clinique des Hôpitaux of Bruxelles*, a communica-

tion from a Dr. Dustin who calls the attention upon another lesion which he claims is of great value. He says:

"The lesions of the rachidian ganglia described by Van Gehutchen and Nelis—chromatolysis and atrophy of the nervous cells, which surround themselves with younger satellites, cells and leucocytes—are of incontestable importance for the post-mortem diagnosis of rabies; however, these ganglionic modifications are sometimes missing, and at any rate are not specific to rabid infection. "Some years ago, Cajal has observed a new alteration of the nervous cells of rabid animals. The neurones of these animals present indeed, in a great many cases and almost constant manner, the phenomena of hypertrophy of the *neuro-fibrillar network* (transformation of the delicate network formed in the neuroma by the nervous fibrilla into bigger and much less numerous fibres). Marinesco has looked for these alterations in man and claims that they constitute a precious lesion, specific of rabid infection. Dr. Dustin from an autopsy of a case of human rabies says that great benefit could be obtained by the presence of the neuro-fibrillar hypertrophy, specially when the lesions of Van Gehutchen-Nelis do not exist. For him in all post mortems of individuals where rabies would be suspected, the lesions of Van Gehutchen must be looked for but the neuro-fibrillar hypertrophy must also be searched. It is an easy and quick inquiry, and by it a sure diagnosis could be reached in a much shorter time than that demanded by the intradural inoculation to the rabbit.

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DRIED TUBERCULOUS DUSTS IN THE CONTAGION OF TUBERCULOSIS.—In the *Presse Medicale* of last October, there appeared an excellent article upon the contagion of tuberculosis by means of dry dust, where the authors give a general review of all that has been already said and written on the subject, and from numerous experiments have come to conclusions quite different to those which I related some time ago in these pages.

First of all, a kind of history of the question is presented. After the discovery of Villemin, showing beyond doubt the inoculability of tuberculosis in 1878, by means of dried tuberculous sputas, then came the assertions of Koch, who after his discovery of the bacillus, made experiments and concluded that if pulverization of damp particles were dangerous, he had no hesitation in considering as much more important in the question, the diffusion of the disease by dry dust. Cornet and Kruger with many others such as Tappenier, Bertheau, Weichselbaum, etc., confirmed those observations, and it seemed as a definite admitted fact that tuberculous infection could take place through moist particles and also by the dried sputa transported with the air.

However, other investigators and even Villemin and Koch, who modified their first impression, declared that the transmission with dried dust was doubtful. Experiments made with moist products produced the disease and failed with dried ones. Cadeac and Mallet, Baumgarten, Straus obtained also various results. And Flugge in 1907 announced that he had but little faith in the infection with such dried products. Calmette does not believe in it. Last year Cadeac concludes that dried sputa are not very dangerous, even by injection, as he had previously concluded to their innocuity by inhalation. And finally, Calmette, one of the most authorized champions of the theory of digestive infection, states well that tuberculosis by ingestion is not synonymous of tuberculosis by inhalation, and he admits that atmospheric air may carry tuberculous bacilli to the first digestive tracts but, for him, this is possible only for moist particles coming from the coughs of the sick individuals and not from the dried dust. Evidently from researches made of late, the doctrine of infection by dried dust is losing ground.

The question then is rather complicated, and opinions are rather divergent. But in their communication to the *Presse Medicale*, the writers, Doct. P. Le Noir and Jean Camus, have asked themselves a single question, and that is the one they are trying to answer. Is tuberculosis transmissible by the dried

dust in the atmosphere in ordinary conditions, not in laboratory experimentation. They did not try to tuberculize their subjects by experiments, but placed them as near as possible in the ordinary condition of infection by dried dust, *if such infection is real*.

Here is how they proceeded:

They selected a ward in one of the hospitals in Paris, which are well kept and in a fair condition of hygiene and under as good sanitary regulations as possible.

In this ward they placed three lots of guinea pigs kept in cages. In one lot of four animals, the cage was without cover and placed on the floor, some distance from the beds of the patients. As these, however, were liable to touch or even feed the animals, it was expected that infection would be much easier with them. One of the pigs died on the 25th day without lesions of tuberculosis. Of the other three, destroyed after two months, one had generalized tuberculosis and the other two were free. In a second lot of five guinea pigs, placed in a cage closed with a double wire net all round, and in such a manner that the patients of the ward could have no access to them. These cages were also placed in a corner of the room and kept there for six weeks, when the cage and its inhabitants were put outside to the fresh air for a month. When they were killed only one had tuberculosis and the others were free. In the third lot the cage was also protected with net wire and placed close to the ceiling. Of the four animals that were in it only two presented bacillar lesions at post mortem.

Therefore it was evident by those experiments and specially for the animals of the second and third lots, that the infection had been realized through the fine and dried dust floating in the air, no matter what had been the door of admission, respiratory or digestive. It must, however, be said that the lesions that were found occupied mostly the abdomen, and were older than those which existed in the lungs at the same time. At any rate, if it is possible that the infection took place through the digestive canal by the swallowing of bacillar dust, it was nevertheless through the dried dust that it took place.

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To complete the conclusions to be drawn from the above, the writers attempted to follow the tuberculous bacilli in the air and more exactly in the dried dust in which they are transported. They made numerous and varied experiments and from them they have arrived at the final conclusion that the dried and light dust flying in a tuberculous ward is not very rich in virulent tuberculous bacilli, but that it may in some cases give rise to tuberculosis. This is another evidence of the already demonstrated truth of the attenuation of the virulence of the tuberculous bacilli by desiccation. But there is a certain degree of variation in this, which, of course, depends on the condition of the desiccation. With dust dried for a long time and free from virulency, there are others fresher, still moist and in those the virulency remains more or less strong. Hence the possibility to explain the results and conclusions drawn from all the experiments.

Finally, in closing the article, it is said: that the danger of tuberculous infection by the dried dust flying with the air cannot be discussed; the authors believe it so much more that at first they had a tendency to adopt the classical doctrine of Villemin and Koch, and it was to convince themselves that these experiments have been made, and certainly if such infection in a well-kept hospital where continuous aeration is kept, has been realized, how much more must it be in habitations where great agglomerations of people exist and where hygienic measures are so deficient.

To this wise conclusion veterinarians have long ago added: how then must it be in the immense number of deficient cow stables where hygiene is almost entirely ignored.

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THE DIAGNOSIS OF HEAVES IN HORSES.—In the *Berliner Tierärztliche Wochens.* there is an article from Prof. Schmidt which has been analyzed in the *Revue Generale* and is quite interesting.

In Germany, the definition of heaves is given as "a respiratory difficulty due to a chronic incurable disease of the lungs or of the heart."

Richter has shown the influence of work upon the temperature of the healthy horse and that of the one affected with heaves. In the first, the temperature rises during work and in the first quarter of an hour the rising is greater than in the following one. The thermic elevation is the same in both the healthy and the heavy horse, but with this last the return to the normal is slower; it requires at least one hour and three-quarters. After three quarters of an hour the temperature is yet above normal by 0.4° and after two hours and half, the temperature is still 0.35° .

The regularization of the central heat takes place, in particular, by the respiratory apparatus, and a difficulty in the respiration must interfere with the deperdition of heat. In a sound animal, the initial heat of 37.8° reaches after exercise 40.4° , to drop to 39.3° after fifteen minutes' rest, to 38.8° after 30 minutes and at 37.8° after two hours. In another animal, the initial temperature from 37.7° reaches to 40.4° to drop to 39.5° after 15 minutes of rest, to 38.6 after 30, to 38.3° after 45, to 38° after 60 minutes and to 37.7° after two hours. In a mare having heaves, the initial temperature of 37.8° rises to 39.3° to remain at that figure after a rest of 15 minutes, at 39.3° after half an hour, at 38.2° after two hours, at 38.3° after three hours. In a heavy gelding the initial temperature of 37.4° rises to 39.4° to remain there after 15 minutes of rest, to 39.2° after 30, to 39.2° after 45 minutes, to 39.1° after one hour, to 38.9° after one hour and a half, to 38.4° after two hours. In a gelding sick with strangles, the initial temperature of 37.9° reaches 40.3° after exercise, after 15 minutes of rest it drops to 39.5° , to 39.2° after 30 minutes, to 38.1° after 90 minutes, 38.1° after two hours and to 38.2° after three hours. In this last horse the temperature raised by exercise drops suddenly after 15 minutes of rest, while in animals having heaves, the dropping occurs very slowly during the first quarter of an hour of rest.

When the temperature of horses that have had exercise does not return to normal after two hours, heaves may be suspected and the suspicion is greater if 30 minutes after exercise the temperature remains still above 38.9° .

When the return to normal temperature is not realized after two hours of rest, the horse is suffering with acute disease of the respiratory apparatus, if the dropping of the temperature is rapid during the first quarter of an hour that follows exercise.

There exists a category of horses for which this appreciation is very difficult: when difficult respiration is accompanied with abundant perspiration without clinical respiratory signs. The study of the temperature before and after exercise gives precious information. For instance, a six-year-old horse having 12 respirations, 30 pulsations per minute, and 37.7° temperature before exercise, presents after 30 minutes of exercise 76 pulsations, 96 respirations and 40.4° of temperature. This last drops to 39.5° in 15 minutes, to 38.6° in 30, to 38.3° in 45, and to 37.8° in two hours. The next day the same horse has 14 respirations, 34 pulsations and 37.9° at rest. But after 45 minutes exercise, 106 respirations are counted, 82 pulsations are registered, the animal gets covered with profuse perspiration and his temperature goes up to 40.3° to drop to 39.6° after 15 minutes of rest and 38.5° after half an hour. Yet this horse has no heaves. Conclusion arrived at by the examination of the temperature after the first exercise. Will this ever be a practical way to diagnose heaves?

ANTINARCOTIC EFFECTS OF LECITHINE.—Some very interesting experiments and no less important results obtained by Dr. J. Nerking were some time ago recorded in the *München. Medizin. Wochens.* upon the effects of injections of lecithine in narcotized and rachi-anesthetized animals, in which the author related what he had observed in his experiments and the possible prospect of overcoming, by the use of lecithine, the unpleasant effects of secondary action that all methods of general anesthesia are liable to give rise to in some given condition.

The starting point of the experiments was the supposition that the state of narcosis, determined by general anesthetic agents, resulting from a temporary combination of the narcotizing substance with the lipoids of the brain, if by the administration of lecithine which is a lipoid, to a narcotized animal, it would not be possible to wake him up from its anesthesia, promote the return of sensibility, the lecithine having combined with the anesthetic substance and leaving free the lipoids of the brain.

The following experiment confirmed the supposition. A rabbit received an intravenous injection of a solution of urethane. Almost immediately he drops in a deep sound narcosis. Another rabbit receives a similar injection, but which had first been mixed up with an emulsion of 40 per cent. of lecithine in physiological serum. With this rabbit the narcosis does not take place, the animal behaves normally. At first, much difficulty was met with by the author in the selection of the lecithine to use. But finally he succeeded in obtaining one which sold under the name of ovo-lecithine of Billon, which he found perfectly pure and which he then used for his researches.

He studied the effects in rats, dogs, and rabbits narcotized with a number of substances, such as ether, chloroform, morphine alone and mixed with scopolamine, urethane, hydrate of chloral and of urethane, and also in animals submitted to rachianesthesia with various local principles. The results have always been the same.

Lecithine has upon general and upon rachianesthesia an antagonistic effect which is most marked. Animals lecithinized do not fall asleep or the narcosis takes place later, and it ends quicker than within witness animals. In individuals which have received intrarachidian anesthesia, the effects are much slower to appear. It remains incomplete and passes away much quicker.

In these experiments the injections of lecithine were made in the peritoneal cavity or in a vein or again under the skin. The intravenous injections are most efficacious. Hypodermic injec-

tions act also very well, when mixed with a 10 per cent. emulsion of lecithine. As this lecithine has no toxic effect, the author recommends its use in human medicine.

Why could not veterinarians resort to it also in their practice, specially in the surgery of small animals where the accidents by anesthesia are not uncommon?

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THE DIAGNOSIS OF PULMONARY TUBERCULOSIS.—Tuberculosis pulmonary localizations are evidently the most frequent. Demonstrated at post mortem, it is often difficult to make their diagnosis during life and as the only pathognomonic proof of pulmonary tuberculosis is the presence of the bacillus in the bronchial or nasal discharges, it is there that they are generally looked for in doubtful cases. The methods of Nocard or that of Ostertag to obtain them are known. Nocard advises to wipe out the inferior openings of the nasal cavities with a sponge, to dilute the discharge so obtained into sterile water and to inoculate guinea pigs with it. Ostertag recommends to obtain sputa from the pharynx or throat as the animal coughs, naturally or artificially, and to use this for experimental inoculations.

For Neuhaus, these methods are deficient and in the *Deut. tierh. Wochens.* he states his objections. First, experimental inoculations require some time and involve expense, besides the fact that it is not always easy to obtain expectorated products, specially when the disease is just beginning. Neuhaus recommends other manipulations so as to avoid these difficulties, viz.: 1. To resort to the microscopic examination of frottis, which is done quicker and is less expensive, or, 2, so as to obtain some of the discharge to puncture the trachea with a trocar, promote coughing by tickling the mucous membrane with fine feathers introduced through the canula of the trocar and as the feathers are taken out they are found covered with mucus or sputa which can be used to make frottis.

Neuhaus relates fifteen cases where he has resorted to this process with the following results: In seven cases, where there

were clinical signs indicating the presence of tuberculosis, bacilli were found in all. In five, obtained from animals that had not reacted to tuberculin, but where considered as clinically suspicious, examination of frottis was negative and all the animals recovered afterwards. In three which had some clinical symptoms and which had reacted to tuberculin, bacilli were found only twice in a great number of frottis in one animal; in another, the bacilli were found very numerous, and in the third there were no bacilli found at one examination, but many were detected in a sputa obtained ten days later. It seems that in Germany where pulmonary tuberculosis is entered in the list of diseases liable to give rise to a breach of contract of sale, and where many law contests are likely to take place, there are numerous instances when amical settlement cannot be reached and the slaughtering of the animal is the only possible way of closing the dispute. Neuhaus then recommends to resort to his method for detecting the bacilli so as to save not only the interests of the parties engaged, but also perhaps that of the professional man connected with the case.

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LOCAL ANESTHESIA.—In our issue of last June, analyzing an article from Director Dupuy and Prof. Van Den Eeckhout published in the *Annales de Bruxelles*, relating to the use of adrenalin and cocain in local anesthesia, I called the attention of our readers to the results that these veterinarians had obtained. The same subject has again been for them the subject of a more extended consideration. They have recalled the effects of each of these drugs and drawn the attention to the results that their combination would give, viz., a stronger vaso-constriction increased by the adrenalin, a slower absorption of the cocain, hence a prolongation of its effects; these lasting nearly three hours. In other words, the association of adrenalin with cocain has essential local advantages and besides them, it reduces considerably the dangers of intoxication by the cocain and the effects consecutive to an injection which are always more or less certain to take place.

The learned professors have in the last two years resorted to the mixture of chlorydrate of cocain and that of adrenalin in about 300 cases. They have used it to perform most varied operations, specially for tracheotomy performed without placing the animal in stocks, for the diagnosis of obscure lameness of the lower part of the leg and also for surgical operations on the foot, puncture wounds, cartilaginous quittor, removal of keraphillocele, removal of the sole, etc. Really to remove a cartilage in case of a quittor with the horse placed only in stocks and held simply with a bridle and without any means of restraint, not even a twitch, is certainly positive evidence of the value of this kind of local anesthesia and of the realization of an immense progress in our surgery. The application is deserving of attention; and it may be that hereafter any kind of minor or even major surgery will be performed with the help of this mixture, whether of cocain, stovain, alypine, novocaine, etc., and adrenalin.

All these mixtures have been experimented with, specially stovain and alypine. With all, complete anesthesia has been obtained. Beginning about fifteen minutes after the injection is made, it has lasted three hours, a length of time always beyond that required for an operation. The injection is always followed by more or less inflammatory swelling at the point of injection, and it occurs with any of the mixtures. However the question of expenses will probably render the use of cocain more frequent, and besides because of its likely being obtained anywhere.

The mixture recommended by the professors of Belgium consists of: 25 to 30 centigrammes of chlorydrate of cocain, stovain or alypine with five drops of 1/1,000 solution of chlor. of adrenalin and 10 grammes of distilled water. Thirty centigrammes of this are used to anesthetize an extremity. No bad effects have ever been noticed even with the injection of sixty centigrammes.

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HEREDITY OF RABIES—VIRULENCY OF THE BLOOD.—A condensed résumé of the studies made by Daniel Konradi on these subjects is published by Mr. Panisset in the *Revue Generale* from the *Centralblatt für Bakteriologie*.

Konradi has already demonstrated the transmission of rabies from mother to foetus and insisted on the necessity to watch for a very long time animals that were inoculated with the nervous centers of foetuses, as sometimes rabies did not manifest itself before 475 days. And he indicated also that the researches upon hereditary transmission should be kept up not only on rabbits, but also on guinea-pigs, which are more sensitive to the virus.

By new researches, this investigator confirms his primitive conclusions. During this hereditary transmission, the rabid virus seems to become weaker and thus would the long duration of the incubation be explained. And besides, atypical forms and specially *recurrent rabies* may also be observed in reacting animals inoculated with the nervous centers of foetuses. Rabbits and guinea pigs present typical manifestations and fever during several days, then there occurs a complete remission of the trouble which reappears later. Two or three successive attacks may be observed in one animal.

Hereditary transmission of rabies has been observed in sluts. The nervous centers of seven foetuses have been found virulent for guinea pigs; a rabbit inoculated with material from one of the foetuses had typical rabid manifestations, 25 days after the inoculation; the disease lasted 10 days and the animal was considered as cured; he was still living two months after being inoculated. Konradi recalls that animals born of a mother infected with rabies, but has not yet shown any symptoms, may nevertheless hold the rabid virus in their nervous centers. A condition that can be explained only by admitting the presence in the blood of the rabid virus at a certain time of the inoculation.

The virulency of the blood of rabid animals is definitely admitted since the experiments of Konradi and of Marie. But it seemed as if the virus does not appear in the blood, only at certain times and in some animals. If Marie has obtained only two

positive results out of twenty experiments, Konradi, using guinea pigs and inoculating a large number of animals, has observed that in all the cases the blood was virulent, as well as in animals infected with street or fixed virus. Small quantity of virus in the circulation and its dilution explain the failures.

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BIBLIOGRAPHIC NOTICES.—The following I have received lately:

The October number of the *Journal of Agriculture of the Cape of Good Hope*, which among its interesting contents gives the continuation of the practical lectures of "Agricultural Zoology," by Prof. J. D. F. Gilchrist, and from Dr. Walter Jewett, F. R. C. V. S., an excellent article on the "Biliary Fever or Malignant Jaundice of Dogs," where the treatment of this canine piropasmosis is considered in its practical application.

Prof. L. Van Es, of the Experimental Station of North Dakota, has favored me with his bulletin containing an article on glanders, which he offers to farmers, students and teachers in the state, free of charge. It is illustrated with six good plates.

The Bureau of Animal Industry has also sent me two of its bulletins, No. 117 and 119. The first is issued from the Pathological Division and is by Dr. H. C. Campbell, V. D. M., on "Leucocytes in Milk with Methods of Determination and the Effect of Heat Upon Their Number." The second, from the Zoological Division, is by Dr. Howard Crawley on "Studies on Blood and Blood Parasites."

Dr. C. N. McBryde, of the Biochemic Division, has favored me with Bulletin 111 of the Bureau also on "Filtration Experiments with *Bacillus Cholerae Suis*."

Finally the last pamphlet on hand was the catalogue of Max Woche and Son, the instrument makers of Cincinnati, which makes a very good exhibition of the instruments which they can provide veterinarians with.

A. L.

NECESSITY OF FEDERAL SUPERVISION OVER BIOLOGICAL PRODUCTS USED IN VETERINARY MEDICINE.

The result of the investigation recently made by the United States Department of Agriculture through its Bureau of Animal Industry, on the standardization of tetanus antitoxin, demonstrates clearly the advisability of federal supervision over its manufacture, and over all biological products used in veterinary medicine. The advantage to practitioner and manufacturer alike, that would accrue from a uniform standard of potency, even if this investigation had shown none of them *below* the strength which they should possess is obvious; but the fact that they have found in some instances the variations to be as much as two-thirds below the strength required, makes standardization absolutely necessary. One drug house carries the antitoxin of one manufacturer and another druggist that of another manufacturer. Some houses may carry that of two or three manufacturers.

A veterinarian has used one manufacturer's antitoxin in a case of tetanus recently treated with success, and desires more for a new case that has presented itself, but the druggist he is convenient to on this occasion does not carry that manufacturer's goods, or the house that carries two or three kinds is out of the particular one the veterinarian has employed in the treatment of his previous case. He is afraid to take the one available because he does not know anything about it, and is familiar with the fact that there is no standardization in this product; and it might *not* be as potent as the one he had used so successfully; or he may have had a discouraging report from a brother practitioner on a case of tetanus that did not seem to him to have been as serious as the one he had recently treated successfully. This brother practitioner chanced to have used the antitoxin the available druggist has to offer. On the other hand a practitioner has had the misfortune of having used an antitoxin *not of sufficient potency* on several cases in succession with disastrous

results, and finally a case presents itself at a time when he is in a position to get an antitoxin of *sufficient potency* to prove efficacious in its treatment, but he has no way of knowing that it is any different from any that he has used—he has lost faith and refuses to “experiment” further.

Unfortunately experiences like the above are met with daily in one place or another, a fact not to be wondered at when we learn from the report on the result of the investigation that only one of the manufacturers of the several, whose products were tested, states on the labels the number of American units contained in their veterinary tetanus antitoxin, and that there is not a uniform potency in the antitoxins prepared by the different manufacturers—the variations in some instances dropping considerably below the strength required.

Veterinarians in large cities *may* learn from experience which one is of sufficient potency to expect results from, but *not* from actual knowledge of the number of antitoxin units contained in any particular one. Picture then the position of the veterinarian practising in the country districts, who may have accidentally learned of the efficacy of a certain antitoxin under the same conditions, but cannot go from one drug house to another until he succeeds in obtaining the one he desires, as the city practitioner can, but has to take the one at hand of which he either knows nothing or has received a discouraging report upon, or else return to his home-town (perhaps a distance of twenty miles) and visit his patient the following day, if possible—having lost twenty-four or more hours in the treatment of the case, thereby jeopardizing its chances of recovery and putting his client to greater expense.

The immense advantage to the practitioner and live stock owner resulting from a uniform standard of potency in tetanus antitoxin needs no argument. As to the manufacturer, if the American method of standardization (which is recommended by the investigators) were adopted, and the federal government saw to it that every manufacturer lived up to the standard, any that were already doing so would receive the government's

protection and the lax ones would be pushed up to the standard and kept there, with the result that the veterinary profession would recover its confidence in this valuable product, its sale would increase very materially, and multitudes of animals that now die from the toxin resulting from the *bacillus tetani* would be saved.

In the July, 1909, issue of the Review, following the statements made by Prof. Anderson, at a meeting of the American Medical Association held about that time, that his experiments showed that the tetanus antitoxin prepared for veterinary use contained anywhere from 17 to 25 antitoxin units per cubic centimeter, while similar examinations of tetanus antitoxin prepared for medical use contained from 150 units to 600 or even 700 units per c. c., we expressed the advisability of the same supervision by our Federal Bureau of Animal Industry over biological products used in veterinary medicine as the Marine Hospital Service now has over similar products used in human medicine: and we sincerely hope, now that the Department of Agriculture has given the matter careful attention, and that the report of the findings of the two experts from the B. A. I., Dr. John R. Mohler, Chief of, and Dr. Adolph Eichhorn, Bacteriologist in, the Pathological Division, has been given publicity, that every necessary step will be taken to make the same an accomplished fact with as much expedition as possible.

THE Iowa Veterinary Medical Association will hold its next meeting at Des Moines, February 15, 16 and 17, 1910.

ALUMNI ASSOCIATION OF ONTARIO VETERINARY COLLEGE—Answering to the call of Dr. Claude D. Morris, of Binghamton, N. Y., fifty-one graduates of the Ontario Veterinary College came to Ithaca at the time of the conference there for veterinarians, in January, and organized an alumni association of that school. Dr. John Wende, of Buffalo, was elected president, and Dr. Morris was elected secretary. Secretary Morris states that there are 278 Ontario graduates practicing in New York State and he believes that within a reasonable time nearly all of these will become members of the organization.

ORIGINAL ARTICLES.

GID FOUND IN SHEEP IN NEW YORK.

BY WALTER J. TAYLOR, D.V.M., AND WM. H. BOYNTON, D.V.M.,
ITHACA, N. Y.

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The disease known as Gid or Staggers in sheep is caused by the presence in the central nervous system of the affected animal of the larval form of the tape worm, *Tænia Cœnurus*. This disease is known by a number of different names among which are *Gid*, *Turnsick*, *Waterbrain*, *Turn-side*, *Goggles*, *Blobwhirl*, *Punt*, *Sturdy*, *Giddiness*, and *Hydatido-cephalus*. Gid or Staggers has for many years been recognized in Europe. Great Britain, France, Germany and Italy are the countries from which it has been most frequently reported. Although various investigations agree as to the cause of the disease and the life cycle of the specific infesting parasite, still in a careful search of the literature we have failed to find any authentic report of a positively identified case of the disease having appeared in the United States.* In August, 1909, the New York State Veterinary College was requested to investigate a destructive disease affecting sheep near Geneva, N. Y. The Director of the College instructed us to make a thorough investigation, which resulted in finding the parasite that was causing the trouble and which has done so much damage in other countries.

HISTORY OF THE FLOCK IN WHICH THE DISEASE WAS FOUND.—In October, 1907, the owner of the flock in which the disease was found imported from Great Britain twenty-five thoroughbred Shropshire sheep. During November of the same year fifty more of the same breed were imported; two Scotch collie dogs were also imported for use as sheep dogs. The sheep showed the first signs of disease about the middle of September,

*A letter to Dr. Moore from Dr. J. F. DeVine, of the State Department of Agriculture, states that Dr. Charles Lynch investigated an outbreak among sheep for the Department in the spring of 1909, and reported that the sheep were troubled with "Gid." He did not, however, report the finding of the cysts of the *Coenurus Cerebralis* in the brain or give other verification of the correctness of the diagnosis.

1908. All of the animals that showed symptoms were offspring of the original seventy-five, and the first animal to die was a six-months-old lamb. This lamb was born March 8 and died September 11, 1908. Another lamb was born March 21 and died September 26, 1908. As the lambs had been grazing upon pasture during the summer, the history would indicate that the infection was through the medium of one or both of the dogs, as they were used for herding the sheep and had free access to the pastures.

The disease appeared again in the spring of 1909 and from that time until the investigation which led to the discovery of the parasite was begun, quite a number of sheep had died. It was not thought that all of the animals which had died showed symptoms of this disease, as by this time the flock had increased to more than two hundred animals and in some cases death was due to other causes. The following table gives a list of the sheep that were lost, the age, and as nearly as we are able to ascertain from the records, the cause of death in each case. Where no cause of death is listed, no post mortem was made, or if made, nothing of particular significance was noted.

TABLE SHOWING NUMBER OF SHEEP LOST, AGE AND PROBABLE CAUSE OF DEATH.

Number.	Date of Birth.	Date of Death.	Age.	Apparent Cause of Death.
*1.....	Mar. 8, 1908	Sept. 11, 1908	6 mos.	Not determined.
*2.....	Mar. 21, 1908	Sept. 26, 1908	6 mos.	Not determined.
3.....	Mar. 29, 1908	Sept. 26, 1908	6 mos.	Not determined.
4.....	May 27, 1908	Mar. 6, 1908	9 mos.	Not determined.
5.....	1906	Mar. 9, 1908	2 yrs.	Bloat.
6.....	1906	Mar. 24, 1908	2 yrs.	Not determined.
7.....	1906	Mar. 26, 1908	2 yrs.	Dystokia.
8.....	1906	Apr. 11, 1908	2 yrs.	Dystokia.
9.....	Mar. 23, 1908	May 22, 1909	11 mos.	Abscess in liver.
†10.....	1906	May — 1909	3 yrs.	Not determined.
11.....	1906	May — 1909	3 yrs.	Died of bloat.
*12.....	Mar. 25, 1908	June 1, 1909	1 yr.	Not determined.
*13.....	Mar. 27, 1909	June 3, 1909	1 yr.	Not determined.
14.....	Mar. 27, 1908	June 20, 1909	1 yr.	Abscess in lung, pleurisy with adhesions.
*15.....	Mar. 26, 1908	July 23, 1909	1 yr.	Not determined.
*16.....	Apr. — 1909	Aug. 19, 1909	4 mos.	Not determined.
*17.....	Apr. — 1909	Aug. 20, 1909	4 mos.	Not determined.
*18.....	Apr. — 1909	Aug. 21, 1909	4 mos.	Cyst of Coenurus Cerebralis in brain.
19.....	Apr. — 1909	Aug. 27, 1909	4 mos.	Cyst of Coenurus Cerebralis in brain.
20.....	Mar. — 1908	Oct. 2, 1909	19 mos.	Cyst of Coenurus Cerebralis in brain.

*Showed symptoms of Gid.

†Found dead in pasture.

The shepherd caring for the flock at the time of our visit had been on the farm only since April, 1909, so could not give us satisfactory data concerning the symptoms of the animals lost prior to that time.

A glance at the above table will show that those animals which have died and which have shown symptoms of gid have been under two years of age. This bears out the statement of investigators who have studied the disease in Europe, that Gid is primarily an affection of lambs and yearlings. It is stated that sheep over two years of age are rarely attacked.

SYMPTOMS EXHIBITED BY THE AFFECTED SHEEP.

A careful study of the symptoms in the affected sheep showed that the symptoms correspond to those mentioned by writers on Gid as somewhat characteristic of that disease.

Sheep No. 19.—This animal was a four-months old lamb of about 60 pounds weight. It is reported to have shown symptoms of the disease for about four weeks. The first indication that

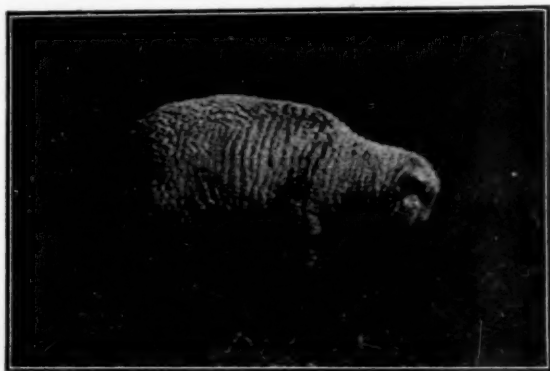


FIG. 1.—Photograph of sheep No. 19, showing the general attitude of depression. Photographed five days prior to killing.

anything was wrong was a general depression and loss of appetite. When first seen by us it stood apart from the flock with head lowered, ears drooping and the general attitude of the animal showing great mental depression. The pulse, respiration

and temperature were about normal. The blood vessels of the eyes were greatly congested, showing what is familiarly called a "blood-shot" condition. Moving objects even close to the head seemed not to be noticed. An examination showed that the animal was totally void of sight in the left eye and nearly so in the right. It moved with apparent difficulty and staggered when it attempted to walk. It became gradually worse, losing sight in both eyes, and when down struggled for some time ineffectually in its efforts to rise. When on its feet it moved with apparent fear, as it occasionally ran into objects in its path (Fig. 1). This animal was first seen August 21, and having become gradually worse it was decided to destroy it and hold a post mortem. This was done on August 27 and the notes are appended under post-mortem findings.

Sheep No. 20.—This animal was an eighteen-months-old ewe. The principal symptom exhibited in this animal was a lateral carriage of the head. Fig. No. 2 shows its attitude when standing. This animal is the one at the left of Fig. 3.



FIG. 2.—Sheep No. 20, showing lateral carriage of the head and "leaning" position when standing.

Sheep No. 20 was observed for some days. The pulse, respiration and temperature were normal and the animal ate with ap-

parent relish and was thrifty. The symptoms were much more pronounced at certain times than at others. She held her head to the right, the right ear drooped and in walking she would usually go in a circle, turning always to the right. She lifted the left front foot high and dragged the right one. The animal gradually lost eyesight. She would often roll over on her back, from which position she would require assistance to get up.



FIG. 3.—A group of affected sheep. Two show the lateral carriage of the head and two show the attitude of depression.

Sheep No. 21.—This was an eighteen-months-old ram. As will be seen in Fig. No. 3, its general attitude and appearance when standing were normal. When he moved, however, there was a jerking of the limbs and an uncertain gait with hesitation in placing the feet upon the ground. When hurried, he moved sidewise something like a kitten at play. The appetite was good and the animal seemed to be thriving.

POST MORTEM FINDINGS.

Sheep No. 18.—This was a four-months-old lamb. When first seen it had been dead about thirty minutes. The history was that it had been affected about two weeks, and the head had been carried to the right. There had been irregular recur-

rences in the severity of the symptoms. It had finally lost the use of its limbs and died lying on the left side with the head drawn backward over the right shoulder.

There was a pronounced stiffness in the neck and a curvature to the right. Nothing of particular note was found in the viscera except hypostasis in the organs of the left side. Three cysts of the *Tænia marginata* (*Cysticercus Tenuicolis*) were found in the omentum (caul) covering the wall of the second stomach. Six or seven of the *Strongylus contortus* were found in the abomasum (fourth stomach), also one whip worm (*Tricocephalus Affinis*). The bladder was greatly distended and the



FIG. 4.—Photograph of the right cerebral hemisphere from animal No. 18, showing the distended lateral ventricle and the position of the cyst.

vessels of that organ congested. It contained about twelve ounces of urine. Hutyra and Marek have called attention to the paralysis of the bladder in cases of *Gid* in sheep. A very few of the *Oestrus Ovis* were also found in the frontal sinuses. These were too few and too small, however, to have caused any visible disturbance.

A sagittal section was then made of the head by sawing through the skull on the medium line. During the process of sawing several ounces of the clear watery fluid escaped. When the head was finally divided into two equal halves, the lateral ventricles of the brain were found to be greatly distended. (See

plate 4.) In the right hemisphere of the brain and somewhat posterior was found a cyst of about two and one-half centimeters in diameter. This was filled with a clear fluid and by holding to the light it could be distinguished as a rounded sac, well defined and covered only with the membranes of the brain. Fig. V. shows the position of the cyst.



FIG. 5.—Photograph of head of cyst, showing suckers and hooklets.

Sheep No. 19.—This animal was destroyed and post-mortemed on August 27, six days after it was first seen. A careful search of the viscera failed to reveal any gross pathological changes. The alimentary tract was found also to be free from parasites of any kind. The skull cap was removed and the brain carefully examined. The lateral ventricles were greatly distended and filled with a clear fluid. Lying on the median

line, a little to the left side and unattached, was a cyst about the size of a hen's egg. The surface of the cyst seemed to be covered with little fine white dots. By the aid of a hand lens these dots were seen to be heads or scolices hanging suspended in the fluid contents of the cyst. The skull immediately over the cyst was greatly reduced in thickness. The cyst was opened and the fluid portion allowed to escape. A few of the heads were carefully removed, mounted in glycerin jelly and examined

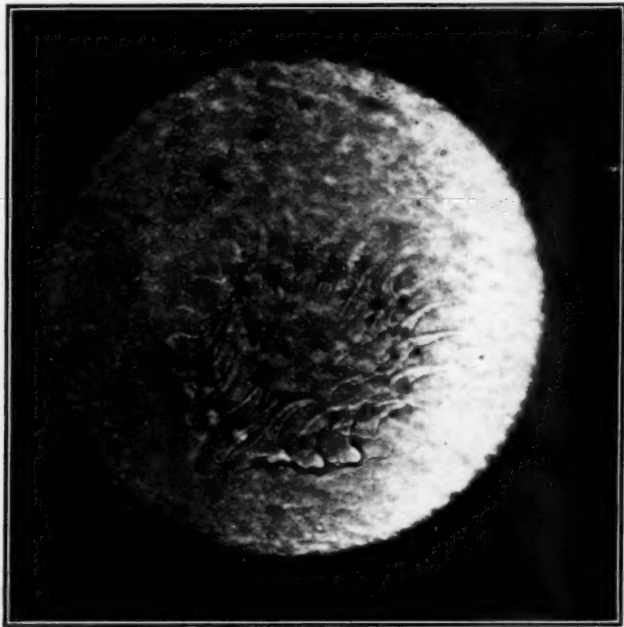


FIG. 6.—A higher magnification of the hooklets.

under the low power of a microscope. They showed the four sucking disks and the proboscis furnished with its hooklets. Fig. No. 6 shows a photograph of one of these heads. The remainder of the cyst wall with the appended heads was divided into two portions, placed in gelatin capsules and fed to two puppies.

September 27 one of the puppies fed with a part of the cyst was examined post mortem, but no tape worm could be found in the intestinal tract.

September 28 the other puppy was examined post mortem also with negative results.

October 2 sheep No. 20 was killed and examined post mortem. Very few intestinal parasites were present. Two cysts of *Tænia Marginata* (*Cysticercus Tenuicolis*) were found on the omentum. When the skull was removed a cyst about the size of a walnut was found on the left side of the cerebellum, by the aid of a hand lens a large number of cyst heads or the scolices could be seen. The entire brain was removed carefully in order not to disturb the cyst and its contents, and fed to a dog.



FIG. 7.—A photograph of the head, neck and a few segments of the *Tænia Cerebralis* from the intestine of a dog fed with the brain containing cyst of *Coenurus Cerebralis* of sheep No. 20.

In about three weeks' time the dog began to lose flesh, but had a ravenous appetite. November 11 the dog was chloroformed and examined post mortem. Several round worms were present in the duodenum. In the small intestines near the ileo-cecal valve a small *Tænia Cœnurus* measuring 17 cm. in length

was found. This worm was examined by Dr. Law, who confirmed the identification.

THE LIFE HISTORY OF THE PARASITE.

The life cycle of the *Canurus Cerebralis* does not differ materially from many of the more common tape worms of animals. The two hosts necessary are the sheep, or other ruminant, and the dog. The tape worm (*Tania Canurus*) in the adult form is a flat bodied worm averaging about one foot, rarely one and one-half feet in length, rather narrow and made up of small segments joined end to end. The narrow end terminates in a small globular head furnished with four circular sucking disks and a proboscis furnished with a single row of from 28 to 30 hooklets. From the other end the ripe segments are continually detached and expelled from the body of the host, and may be recognized as little, white, flattened, oblong objects progressing over soil or objects upon which they may have become lodged with a vermicular movement, and depositing a large number of microscopically small eggs with which they are literally filled. Taken with the food or water into the body of a lamb, these eggs open as a result of the digestion of the outer membranes and set free an ovid six-hooked embryo, which bores its way through the walls of the stomach and, probably penetrating a vessel, is carried to all parts of the body. Those which become lodged in the central nervous system are the only ones which pursue their development and it is there that they encyst themselves. The cyst may survive for a long time in this situation, and if its host is eaten by a carnivorous animal, such as the dog, it will develop in its bowels into a mature tape worm and reproduce its species as before.

The Cystic Stage.—Having arrived in the brain cavity, the young embryo migrates upon the surface of the brain by burrowing through that organ. The *galleries* it makes are sinuous, superficial furrows of a pale yellow tint at the termination or in the neighborhood of which the vesicles are met with. They be-

gin at a point and slowly increase with the growth of the parasite and run in any direction. At the end of two to three weeks after the invasion, the cysts are about the size of a millet seed; from a month to a month and a half they are about the size of a pea, but up to this time they do not give any indication of the formation of scolices or heads. Later when the vesicles have reached the size of a cherry, these heads appear as opaque depressions upon the surface. At the end of two to two and a half months the perfect heads are seen. Not all the heads in a given cyst mature at the same time. There may be seen those varying from the fully developed to the newly started as well as those in all degrees of approaching maturity. When examined closely they will be found incased in a thick outer skin, a sac made by the membranes of the brain. Out of these sacs the parasites may be loosened. Many hundreds of little knobs, each representing a single head, may be seen hanging from the inner surface into the fluid of the vesicle. Each of these knobs can evert itself, or push its head out, and can then be seen by the aid of a glass to be a perfectly developed head, having four suckers and a crown of about twenty-eight hooks. These heads, when the cysts are fed to dogs, may develop into as many individuals. Most of them, however, generally die while only the stronger survive.

Symptoms.—The symptoms of *Gid* in sheep are dependent upon the stage of invasion and the development of the parasite. Between the second and third week those worst affected show signs of inflammation of the brain and surrounding tissues. Curtis states that few lambs show symptoms during the first stages of the development of the parasite. Among the symptoms mentioned by Law are great nervousness and fear without apparent cause, or dullness, stupor and aberration of the senses, and disorderly muscular movement. The sheep is found apart from the flock, with red eyes, dilated pupils, blindness and unsteady gait, but with a tendency to move restlessly in one direction. Left to itself it neglects to eat or drink and wastes daily, but if well fed

and excitement avoided it may even gain flesh. If the cyst is situated on one side of the brain the lamb turns to that side, moving in a circle. The limbs on the opposite side of the body show inco-ordination of movement and act as if partially paralyzed. If there is one on each side of the brain the animal turns to one side or the other, according to the relative activity of the parasite at a given moment. When the cyst is on the median line it elevates its nose and advances in a straight line until stopped by some obstruction. When located in the cerebellum the host lifts its limbs in a jerking manner, sets them down in an uncertain hesitating way, stumbles and falls, struggling for some time ineffectually in its efforts to rise. If situated in the spinal cord, difficult breathing and paralysis are marked symptoms. Curtis states that cysts in the spinal cord are liable to cause sudden death without the premonitory symptoms. The disorders may be extreme at first, but the animal may get better, seem nearly normal and again come down with pronounced symptoms. These variations in symptoms and recurrences of the attack are attributed by some to the activity of the scolices and the irritation which they may cause, being more active at given times than at others.

In carrying out this investigation, we are greatly indebted to the owners of the animals for the liberal donation of the affected sheep. We are also indebted to Dr. James Law and Dr. D. H. Udall for valuable aid in this work.

ONE prominent veterinarian of Greater New York, stated recently that he was putting aside a dollar a day toward San Francisco in September.

THE Pennsylvania State Veterinary Medical Association will hold its annual meeting at the Veterinary Department of the University of Pennsylvania, on the 8th and 9th of March the first Tuesday and Wednesday after the first Monday.

THE recent conference for veterinarians, at Ithaca, N. Y., was a splendid success. One hundred veterinarians registered on arrival, and there were ten to fifteen others who did not register. The program was ample and thoroughly enjoyed by all.

HOG CHOLERA AND HOG CHOLERA VACCINATION.*

BY DR. M. H. REYNOLDS, ST. ANTHONY PARK, MINN.

The term hog cholera has become quite ambiguous partly on account of new discoveries concerning the cause of the disease, partly on account of what have been supposed to be two different but curiously related diseases having been generally included under this general term. Until within a year or two we have supposed that there were two infectious diseases of hogs recognized under the general terms of hog cholera and swine plague. It now seems probable that we will be able to do away with the term swine plague entirely.

The disease considered in this article and one for which the Dorset-Niles or B. A. I. serum (to be referred to later) is prepared, must answer to the following requirements:

- (a) Be infectious by association or other natural exposure.
- (b) The animal before death and the carcass after death must show certain accepted symptoms which are clearly recognized as pertaining to cholera.
- (c) The blood must be virulent and capable of reproducing the disease by inoculation into susceptible hogs.
- (d) Attack and recovery must confer immunity.

Note that we might easily have disease among swine where characteristic "a" or even "b" might be present and yet the disease be not true hog cholera.

CAUSE.—Until within recent years American authorities, bacteriologists and veterinarians alike have very generally accepted the bacillus of Salmon and Smith as the specific cause of hog cholera, and another somewhat similar germ as the cause of what was supposed to be a distinct but curiously related disease, swine plague. But within a few years workers in the Federal Bureau

* Read at Minnesota State Veterinary Medical Association, Stillwater, July 14 and 15, 1909.

of Animal Industry have apparently demonstrated that hog cholera is caused by a living germ so small that it passes easily through germ filters, which remove all known forms of the bacillus of Salmon and Smith. It may be interesting to note further that this newly demonstrated germ is so small as to be invisible to the highest available powers of the best microscope. That it is a living organism and not a chemical poison may be easily demonstrated.

The curious relations to this disease of the old bacilli of hog cholera and of swine plague are not well understood, but it seems quite possible that they may play some part in the later development of the disease after the disease processes have been started by the invisible germ. To Drs. Dorset, Bolton, and McBryde of the Bureau of Animal Industry belongs the credit of this very important information. It is very important because a successful immunizing vaccine for cholera is based on it. Their work was published in B. A. I. Bulletin No. 72.

While our old theories and supposed information concerning the cause of hog cholera have been disturbed by this newer work, it is important to remember that hog cholera is now just as much as before, to be recognized as a distinctly infectious disease.

It is important to remember also that this infection is absolutely necessary or there can be no cholera no difference how susceptible animals may be. There can be no cholera without this primary and specific cause any more than there can be mustard plants in our western wheat fields without the previous presence of mustard seed. Conditions of soil and climate may favor a rank growth of mustard. Conditions of feed and keep may favor the development and spread of hog cholera. They may decrease resistance and increase susceptibility, but cannot originally cause the disease.

It is a rather common experience that hogs kept closely housed and heavily fed especially with such foods as corn, offer much less resistance than do other hogs. In our vaccine work we frequently find hogs of this type which die readily under in-

oculation with blood of low grade virulence. Hogs of hardier type may become slightly sick or not sick at all with inoculation from the same infectious material.

DISSEMINATION.—The farmer and the public in general should bear in mind that the cause of hog cholera is a living organism capable of enormously rapid self multiplication; actual though very minute particles of matter. It is the veterinarian's duty to teach this persistently. This fully understood, makes it apparent that infection may be carried in any way that dust or other fine particles of matter may be carried. It thus becomes very apparent that the infection may be carried by sick hogs or upon the legs and bodies of hogs not sick; or carried in wagon boxes, in hog racks, in stock cars, or upon shoes and clothing of people, or by dogs.

It is very evident that the infection may be carried down stream, especially in small creeks and give rise to other outbreaks.

So far as sick hogs are concerned, we are quite sure that the blood and the manure are infectious, and there can be no question concerning the infectiousness of fresh carcasses of dead hogs.

SYMPTOMS.—Perhaps we should say first of all that we rarely get a full showing of accepted symptoms of hog cholera in one case. It is important to bear in mind that cases vary in virulence from those of very chronic type where hogs live for weeks and finally die or recover, to very acute cases where they die over night.

The hog coming down with cholera is usually sluggish at first lying around in the shade and refusing feed. The hair may become rough. The eyes early show symptoms of inflammation with a sticky discharge. There is often a suppressed cough. The gait may become irregular and uncertain especially with the hind legs.

After these preliminary symptoms have been shown for a time, the skin becomes red, changing to purple especially noticeable in white haired hogs.

The hog is then usually within a very few days of death. As already explained, not all cases are typical. Sometimes hogs die from undoubted hog cholera and yet the ante-mortem or post mortem symptoms show very little upon which to base a diagnosis. But we may easily demonstrate that these were cases of cholera by injecting their blood into susceptible hogs and by thus producing typical cholera.

At the autopsy of an ordinary case of cholera the first, and perhaps the most striking, thing seen is the purpling of the skin. On opening the carcass small hæmorrhages may be found under the skin and in the fat cut through. Mesenteric and other lymph glands are intensely inflamed. The mucous membrane of the stomach is frequently thickened and roughened and in chronic cases there may be ulcers. On opening the intestines we see areas here and there of intense inflammation in acute cases, or numerous ulcers in cases of chronic type. In very acute cases we find areas intensely inflamed, even hæmorrhagic in places. The slow chronic cases develop characteristic hog cholera ulcers. These may appear at almost any point on the mucous coat of the digestive tube. On stripping off the renal capsule a typical case of hog cholera will usually show minute hæmorrhages on the surface somewhat resembling the coloring of a turkey egg which gives the common name "turkey egg kidney" of hog cholera.

DEALING WITH OUTBREAKS.—Vaccine is not yet generally available and will not be generally available for some time. There will always be a great many unvaccinated hogs in any case. Clearly, therefore, there are certain things which the owner of healthy hogs in a hog cholera district should do and many things which he should not do. The same is equally true for the man who has sick hogs in a neighborhood where there are uninfected herds. Here again the veterinarian must show his public spirit by service as a persistent teacher. The owner of healthy hogs and his family should keep away from public stock yards, and from all pens and yards on the other farms, whether sickness among hogs prevails or not. It can easily oc-

cur that a neighbor's hogs may appear well but have recently received infection and be already capable of scattering the disease. We do not know at what period in the development of this disease infected hogs become capable of disseminating cholera.

During a hog cholera season the owner of healthy hogs should institute private quarantine and pleasantly perhaps, but firmly ask visitors, especially stock buyers and threshing machine crews, to keep at a reasonable distance from his pens and yards. It is safer for one man to have exclusive care of healthy hogs during a hog cholera season and this man should be very careful where he goes with reference to possible infection. Special fencing or other provisions should be made wherever practical to keep dogs out of the pens and yards; for under certain conditions dogs become very active agents in spreading the disease.

The owner of a healthy herd should be very careful about buying hogs for breeding purposes, for here in the West at least, we must regard all public stock yards and stock cars as possible sources of infection. Hogs coming by rail into the herd for breeding purposes should be shipped in other than stock cars, and should not be loaded or unloaded so as to go through stock yards. All new hogs coming on to a farm where the disease has not appeared should be kept carefully apart from the herd for from two to three weeks after arrival. The disease may thus have time to develop in quarantine if the animals have been infected before shipment or en route. It is decidedly worth while to be careful about clean feeding, for it seems probable that this is a common method by which infection enters the body.

A DISASTROUS EXPERIENCE.—The farmer should be especially careful about buying hogs out of stock yards. Some years ago a certain Minnesota farmer purchased a lot of feeders from Sioux City and took them home to his farm. In about two weeks his hogs commenced dying. Two weeks later hogs previously on the farm began dying. In a little while he was losing

hogs at the rate of twenty-five a day, losing a total of about two hundred (200). This loss of 200 hogs was scarcely a drop in the bucket, too small for consideration in comparison with the loss which this outbreak cost the State of Minnesota.

As soon as this Minnesota farmer realized that he had cholera and was liable to lose a large portion of his herd, he shipped out a lot of fat hogs. These were yarded for a time in the public stock yards of his town and one of them died while waiting for shipment. This hog was left for a day or so in the yard. Later a carload of feeding hogs was shipped in from a point in South Dakota, where they never had hog cholera. These South Dakota hogs were unloaded into the yards where the fat hog had died some time before, and were sold out from there by auction.

It was a very interesting study to follow the resulting outbreaks, but it was a very serious matter for the owner and for that entire portion of the state. Practically every farmer who bought hogs at this sale and many of those who walked around the yards looking at the hogs but without buying, had hog cholera on their farms in a very uniform period after the sale. Surely the moral of this tale is so self-evident as to need no further suggestion. It is our duty as veterinarians to help prevent such occurrences by good teaching.

Under the head of prevention I must mention vaccination, thanks to the federal Bureau of Animal Industry and especially to Drs. Dorset and Niles of that department. We now have a practical working vaccine which will immunize hogs and which seems to have considerable value when used with very recently infected hogs that are not yet sick. It may even have some curative value, contrary to some vaccination theories, when administered to sick hogs in early stages of the disease.

TREATMENT.—This seems worthy of a special heading just to attract attention and impress a lesson. All that is worth saying can be put in a few words. Very few reputable veterinarians and very few owners who have had actual experiences with treatment of hog cholera have any confidence in medical

treatment. Farmers would do more wisely to invest their money in disinfectants, and especially in Dorset-Niles vaccine, if the latter is available, and farmers should be so advised by their veterinarians.

CLEANING UP.—When the outbreak appears to be over, the advising veterinarian and the owner must decide as to just what *shall* be done in the way of disinfection and cleaning up or whether the farmer will stay out of the hog business for a year or so and allow the infection to die out. This is, of course, without regard for the possibility of putting in vaccinated and immune hogs.

Feeding troughs and feeding floors and the hog house in general may be disinfected, if of reasonably good construction.

If the sick hogs have been kept in an old straw shed or in an old hog house that is about ready to fall down any way, by all means the best method of disinfection is by burning. The slow old chronic cases that go dragging around at the end of an outbreak should usually be killed and safely buried, for it is rarely profitable to put such hogs in shape for market, and they may maintain the infection for an indefinite period. It might possibly be worth while to hold such a case over and nurse it along in case of a very valuable brood sow, for hogs having recovered from cholera are usually immune for life. Brood sows which have had the disease and recovered usually give something more than natural immunity to their offspring. But the degree of immunity so conferred to offspring appears so variable that it cannot be depended upon as a routine method of establishing immune herds so far as we know at present.

Yards may be practically disinfected by plowing or by cleaning, and burning off a good layer of straw.

VACCINATION.—Generally stated, the vaccine consists of two parts: (a) Blood serum from the body of a specially immunized hog and (b) virulent blood serum from the body of a hog about to die from cholera. The general theory upon which this double vaccine is used is that of giving the animal an infectious disease and at the same time a treatment which enables the ani-

mal to resist the invasion. When the hog is through with it he is presumably in the same condition as though he had gone through a natural exposure and recovered.

GENERAL METHOD.—We start this work with hogs that are immune usually because they have passed through an outbreak. It has been shown that when such immune hogs are treated with large injections of virulent blood under the skin or into a vein they do not usually become sick, but their own blood develops a peculiar property that gives protection to other hogs that are naturally susceptible. When the blood serum from this specially treated immune hog is injected into the bodies of healthy susceptible hogs, the latter becomes likewise immune; but the immunity so gained lasts only a short time, possibly four to six weeks, and is then gradually lost. If we give a small injection of virulent blood at the same time or soon after the immunizing serum is given, or give pen exposure with sick hogs, then the treated hog becomes immune for a long period, perhaps for life.

THE SERUM HOG.—The specially immunized hog which produces this immunizing serum is known as a hyperimmune. The simply immune hog may be prepared for producing serum in either one of three ways.

(1) By three rapidly increasing doses of virulent blood serum injected under the skin at intervals of seven to ten days.

(2) By one very large injection of virulent serum under the skin.

(3) By injecting virulent serum in smaller doses into the venous circulation. In this work we may give an ordinary immune hog weighing 100 pounds a quart of very virulent blood, a teaspoonful of which similarly injected would kill a hog that was not immune.

In other words, the immune and especially the hyperimmune hog have developed certain properties in the blood antagonistic to hog cholera virus.

VACCINATION.—We have two possible methods of vaccinating or immunizing hogs.

(a) *Serum only*, which is by injection under the skin of serum from an hyperimmune hog, and gives immediate but temporary immunity lasting as already stated several weeks. As stated before, if the animal during the period of immunity is exposed to natural infection, he becomes protected for a very long period, perhaps life.

(b) *Simultaneous*.—The second method of vaccination consists of injecting immunizing blood serum into one thigh and a small amount of disease-producing blood at the same time or soon after into the other thigh; thus giving the animal the cholera and an added resistance at the same time. If the immunizing serum is potent and the virulent serum is really virulent, then the animal so treated becomes permanently immune.

The serum only method is usually preferred in actual outbreaks for hogs not yet sick, because this gives immediate protection and the hogs being naturally exposed usually develop a permanent immunity. The simultaneous method of vaccination is preferred where we are very confident of the potency of the serum to protect against the virulent blood and for hogs that have not yet been infected. It may yet be found wise to use this method even in outbreaks.

VACCINATION SPREADING CHOLERA.—Intelligent stockmen and veterinarians will probably ask if there is not danger of spreading cholera, by this simultaneous vaccination, into districts where it has not yet appeared. We have considerable amount of direct evidence on this point that is better than any amount of theorizing and personal opinions. This evidence all agrees that unless the vaccinated hogs become distinctly sick as a result of the vaccination (which can occur and does rarely) that there is practically no danger of disseminating the disease by this vaccination. This is especially true since all hogs on the farm are supposed to have been treated and be immune and therefore incapable of developing cholera and so spreading the disease. It does occur even with good serum, I suppose, that an occasional hog may become a little sick and even die as a result of vaccination.

But with good serum given in standard dose and virulent blood also given in proper dose, the risk of this is so small that it may be safely disregarded; especially when all hogs on the farm, or that may be exposed with such sick hogs, have been treated.

We have purposely vaccinated hogs by the simultaneous method and given susceptible hogs the closest possible exposure with them without any illness on the part of unprotected hogs.

It is conceivable, of course, that an operator might be careless and spill virulent blood where it could cause infection if carried to untreated hogs, but thus far in our work, and this has been the experience with others who are working with this problem, the risk has been so slight that we no longer concern ourselves seriously about it.

THE VACCINE.—There are some requirements to which a practical vaccine must answer. It must not be unreasonably expensive. The vaccine must have good keeping qualities and must not be dangerous to handle.

It must be convenient to administer and be practically free from danger for treated and untreated hogs.

It is quite true that this vaccine and our methods of use are far from perfected as yet. There are some faults which should be overcome if possible. The dose of this serum is large and expensive in proportion to the amount used. We have no method of standardizing its potency. Virulent blood must be used with the serum to give permanent immunity. There is always a possible chance of getting a mixed infection and causing septicæmia of treated hogs by using contaminated serum or contaminated virulent blood.

We hope to reduce the bulk and therefore the cost by increasing potency. We expect to further reduce the cost of production by using the carcass of hyperimmunes when they have performed their services, and also the carcass of virulent blood hogs.

The former carcasses are usually fit for food purposes and should be disposed of to the best economical advantage for such purposes.

If we are unable to standarize the serum as to potency, we may at least find out the amount necessary to protect and then give a large enough dose to accomplish the purpose. The danger from septicaemia, if we may judge from considerable practical experience is slight and may be disregarded. We must simply take our chances on this point. There may occur an occasional loss, but the losses should be as nothing compared with the very great saving to the hog producer in general.

Some estimate of the probable cost of vaccination may be given by a statement that the present cost will probably average about 2c. per c. c. for the immunizing serum and approximately 1c. per c. c. for virulent blood serum. A suckling pig dose would cost about 20c. The cost of immunizing a shoat weighing from 50 to 100 pounds would be from 40c. to 50c. by the permanent method.

SERUM WORK.—Our results in Minnesota have been very satisfactory and so have been the results in some other states where this serum is being produced, although we have all had our delays, our apparent failures, and our disappointments. A general statement of results should appeal to practical common sense when we say by way of introduction that in no case has a hog apparently in good health at the time of vaccination and not previously exposed to cholera, and which received the standard doses of tested serum and virulent blood failed to prove absolutely immune to the hardest tests. Our results have been tested by closely associating vaccinated pigs with those that have been sick and dying in small pens and even by allowing them to eat the carcass of hogs dead from cholera which is considered a severe test. A rather large number of susceptible hogs have been inoculated with virulent blood and then protected by serum when other hogs not so protected have all died.

The Minnesota Experiment Station took up this work in November, 1907, doing some purely experimental work, and also making a considerable number of actual farm demonstrations.

In herds already infected we vaccinated up to a certain date to which our results have been carefully checked 251 hogs, of

which there died 44. In these same infected herds there were left unvaccinated 76, of which there died 68.

Of hogs not yet exposed to infection we vaccinated up to that certain date 201, of which there died two hogs, neither of which, however, showed clear hog cholera and may have died of some other disease. It should be explained further that the vaccination of all these cases was rigidly tested either by inoculation with virulent blood or exposure with sick hogs.

In the healthy herds where we vaccinated 201 as previously stated, there were 9 healthy animals left untreated, *all of which died.*

Our results during the past year were so encouraging and the need for such a vaccine was so evident that our last legislature appropriated the sum of \$10,000 for a vaccine plant at the Experiment Station and we hope to soon have ready for use the best hog cholera vaccine plant in America to the credit of Minnesota.

GENERAL CONTROL WORK.—Hog cholera control work offers some very large and very difficult problems for solution and yet not hopeless problems by any means. The writer believes that we have now reached such a stage that state and federal sanitary authorities should be very seriously studying methods of more rigid control work with hog cholera with a view to a possible ultimate eradication. The common attitude of public authorities toward hog cholera is not creditable to modern sanitary science to say the least. We are not justified in ignoring a source of enormous financial loss simply because the problem is large and control must be expensive.

The very nature of its cause, its methods of spread, and the character of the disease itself makes it one difficult to control.

Yet the losses are so enormous that individual states and the general government might well be justified in spending large sums for testing in actual field trial methods of eradication.

Eradication of hog cholera; think of it! What a splendid task for any man. Let us talk about it, and for it, and if there ever comes opportunity let us help the cause along.

THE PROVISION OF MILK FOR CITIES.

REPORT MADE TO THE IX. INTERNATIONAL VETERINARY CONGRESS BY PROFESSOR
RIEVEL, OF THE ROYAL VETERINARY COLLEGE, HANOVER, GERMANY.

Translated by L. M. STECKEL, D.V.M. (O.S.U.). 1

Milk is not only the most agreeable and generally used article of food, but is also the cheapest we possess. It is a food indispensable for infants and children. It would, therefore, be justifiable that the milk be placed under systematic inspection regulations, at least similar to that of other foods. When one observes with what particular care the other articles of food are treated from the time of preparation to the time of consumption; when one notices the rage of an epicure if his wine is not just cold enough, or the oysters not just right, it is almost incredible that the public are so negligent as regards the milk. So long as the milk does not curdle and has no noticeable odor, then the public is satisfied. This ignorance and carelessness of the people stands as the only reason why in the past century so little change took place in the methods of dairying. While such enormous changes have taken place in the fields of the other food stuffs, the production and handling of the milk have remained as in the days of our grandmothers. Is then this indispensable article of food to remain in this backward condition. Certainly not. The infant mortality in Germany teaches us a good lesson. The number of artificially fed infants is very large. As the artificial food is mostly cow's milk, we must attribute to it the deaths due to stomach and intestinal troubles which for the past fifty years have continued almost at the same rate. It is still 25 per cent. The scientific researches for the hygienic and social betterment have clearly shown that a large number of injurious agents or "noxen" can be harbored in the milk. These "noxen" come either from the cow or find their way to the milk after milking. It is to be regretted that as the appearance of the milk is not altered, the consumer has no suspicion whatever. Under ordinary

circumstances the public is not able to protect itself against the threatening dangers of bad milk. It is, therefore, absolutely urgent that the state should lawfully regulate the production of milk, thereby assuring the health of its citizens—the most costly asset which it possesses.

Not alone from the hygienic, but also from the economical standpoint it is necessary that the state regulate the milk trade. Germany's production of milk represents in value an amount of 1,700 million marks, even at only 9 pfennig per liter. From this sum there is an annual loss of 170 million marks, or 10 per cent., on account of spoiled milk due to bad management. This enormous sum ought not to be lost to our dairy industry, especially now when the need of milk is constantly increasing. Owing to the progressing anti-alcohol movement, the use of alcohol is considerably decreasing while the use of milk is comparatively increasing.

Through the reach of a good and wholesome milk we can aid the progress of the anti-alcohol movement.

How should the demand of furnishing a pure and wholesome milk to the public be accomplished? As stated above, the injurious agents found in the milk may come from the cow. In this case it must be seen that the dairy animals should be in perfect health. While with proper care the entrance of "noxen" during and after milking could easily be avoided. It is a proven fact that milk from healthy cows is sterile. Now if the production and handling be cleanly and the milk kept cool until used, it would be a perfect product.

The efforts exerted should be not to destroy the "noxen," which are already in the milk, but to prevent their entrance. It is not only necessary that the milk contains the necessary per cent. of fat, but also that all the biological constituents are in the right proportions, for the richest milk can still be dangerous as a food.

We can readily see that the milk inspection as has been thus far carried out is not sufficient. Although unadulterated, milk

through changes of decomposition may become a dangerous article of food. In order that the inspection be of value, it must begin at the source of production and include the supervision of the health of the cows, their stabling, feeding and breeding, of the milking and handling of the milk. At the laboratory the milk should be examined for the biological qualities and the fat content. Thorough inspection can not be carried out in the street, there must be special laboratories for this purpose. A systematic inspection shall include the examination of every cow's milk. It will take a great deal of pains and labor to reach this end, but the achievement of it is not an impossibility.

An important factor in the achievement of our end are the so-called Control Societies. These societies are continually selecting the best cows for the dairy or milk purposes. A number of these societies have had very good results and may be cited as an example to show that by good will on the part of the dairy-men this exacting demand of examining every cow's milk could be accomplished. It is needless for me to say that such an examination need not be done every day, it suffices when done at intervals. The work in milk inspection is, therefore, to be transferred from the chemical laboratory to the cow stable or rather into a veterinary laboratory. The veterinarians are, therefore, the only persons who ought to be charged to carry out the modern milk inspection work.

How should we organize milk inspection in cities? Most of the city's milk supply comes from the outside territory. Very little milk is produced in the city itself and this is usually used as special or children's milk. The milk is brought to market either wholesale or retail. The sale takes place either in the open street or in closed rooms. At the large milk companies' plants the milk as soon as it is brought over is inspected, then strained, clarified, aerated, cooled and often pasteurized, and is then either put up in bottles, or filled into special cans or tanks and sold in the open. By the aid of stirrers the fat is prevented from rising and an even quality of milk is served out, and

through fitting lids the dust is kept out. At the large dairy farms they also have all the apparatuses for cleaning and handling of the milk, thereby guaranteeing a clean milk. The small dealers on the contrary sell the milk from the cans just as it comes from the farmer. Usually the milk is poured from the large transport cans into smaller ones to be measured out to the customers. In this way there are plenty of chances for contamination. This is specially true where the drivers have the habit to drink out of the lids or the quart measure and often more than one drink from the same vessel and then what is left over from the drinking is poured back into the can. As a rule the milk from small dairy farms is not as good as from the large ones, since the stabling of the animals as well as the production and handling is not carefully attended to. At the small dairy farms there is no inspection to speak of, the milk is little or not cooled at all, and when delivered to the consumer is often in a stage of high acidity. The middlemen through whom the milk passes before reaching the consumer are all trying to make some gain. When we see that an entire family supports itself through the sale of only a few cans of milk we can not but suspect that the milk is skimmed, watered or both. The sanitary regulation prohibiting water to be on the milk wagon can easily be gotten around. It is no difficult task for a milk peddler to find water at suitable places.

But still worse are the conditions where the milk is sold in closed rooms. The salesroom itself may be in conformity with hygienic requirements, but how are the other milk rooms? The milk room is often the dwelling place of the family, or joins directly with the family room, which serves often as the sick room, too. In these places they keep alongside the milk many odorous materials, such as soap, petroleum, cheese, herring, etc. Now, who buys milk in these places? The poor people whose children live under miserable social and hygienical conditions and are just the ones in need of the best milk. And yet the price is the same as for good milk.

Now such milk places the Health Department ought to close up. Only those persons who have taken out a license should be allowed to sell milk. The license should be granted to those who have complied with the hygienic requirements and who will adhere to them in the future. As to the question whether the milk trade should be centralized, I would say that as regards the fulfillment of hygienic regulations it would be commendable. Although the large dealer or the milk company receives its milk from many dairymen, they have more or less control over the production and handling of the milk. This control they exercise by making contracts with the dairymen to that effect. Further, at the large milk companies they examine the milk in their own laboratories and verify anything wrong with the milk; they also strain, clarify, aerate and cool the milk, thereby making it cleaner and better. The sale or delivery of milk in specially prepared wagons assures a more even quality of milk than when just a few cans are wheeled around on a cart; also, by the latter method the milk cannot be kept cool, and the constant opening and closing when measuring out affords a chance for contamination. In the large trade there is less danger from adulteration, since the milk is usually in closed vessels and the addition of water is not very easy, and, as there are often more than one person at the delivery wagon, any meddling with the milk would sooner or later be reported. On the other hand in the small trade adulteration is easier, and less chances for reporting, since the immediate family do everything themselves. Veterinary supervision of such centralization places is very plain and easy. The most ideal delivery of milk would be in bottles, for here contamination would be reduced to a minimum. In the summer the bottles could be covered with colored paper to prevent decomposition through direct sunlight.

The sale of milk in bottles could be introduced without raising the price of the milk. The public should be educated to accept their milk in bottles only and be guaranteed a pure and clean milk. As soon as the public will demand it the dealers will have to come up to it. The good results of centralization as

obtained by the city of Copenhagen may serve as an example to recommend it for other cities. The German and International Societies for Milk Industry have also continually advocated centralization, for by this means only could the exacting demands of the Board of Health's regulations be carried out. But so long as there are no national milk inspection laws it behooves every community to supervise the production and sale of the milk just as they do the meat and the water. The supervision should especially be applied to milk sold to hospitals, orphan asylums, children's homes, and sanitariums. To accomplish this it is necessary that the entire milk production should be under veterinary supervision. It is not sufficient when a casual sample of milk is inspected by a lay police official; all the milk sold must be carefully inspected. The city regulations should be to examine all the milk brought to the city, the examination to be at some central place as at the large milk companies' stations, or at some specially built milk yards. In many cities where they have city abattoirs the milk yards may perhaps be placed near the abattoirs, as here there are good transportation facilities, machine power, refrigeration rooms, etc. All dairymen will, of course, have to submit to the hygienic requirements imposed upon them. The milk from the different dairies should not be mixed before it reaches the city. It should be kept cool until delivered. As soon as the milk reaches the city it should be examined as to temperature, specific gravity, odor, taste, appearance, and by the alcohol method as to degree of acidity. From time to time samples should be taken and kept for a more thorough examination.

It would be better still if these milk yards or courts were under the management of the city authorities. This does not necessarily mean that the city should also own the dairies, for under special contracts with the dairymen a good milk could be obtained. In these milk courts the various milks would be examined, then mixed, clarified, aerated, cooled, and a special milk prepared for infants. Delivery of milk should be in bottles and whether at private families or stores it should be kept cold until

used. Any milk in excess of the day's consume could be sold to bakeries, or made into butter and cheese. In summer when the milk supply exceeds the demand it may be possible to freeze the milk into ice blocks for use in the winter. In von Hempel's experiments clean frozen milk kept fresh for five weeks with its bacterial number considerably reduced at the end of that time.

In the interest of this good cause the city should stand the running expenses of these milk courts or stations. By eliminating the middleman the price of milk would remain the same to the consumer and a little more could be paid to the producer. It would not be advisable to raise the price of milk, as this will be felt mostly by the poorer classes who are just the ones in need of good milk. The Berlin Milk Journal gives an idea of the gain made by the large dealer with present milk prices when it quotes that the Bolle Milk Company of Berlin is paying 65,000 marks taxes which is on a yearly income of 500,000 marks.

By carrying out the above recommendations the city will be in a position to furnish to its constituents pure and wholesome milk. The public will, before long, have the same confidence in this new enterprise as they have in the city's meat and water control. The results would be a rise in the use of milk, a reduction in the use of alcohol, and better, stronger, and healthier citizens.

SUMMARY.

1. The provisions that have hitherto been made for the control of milk are entirely insufficient.
2. Efficacious milk inspection should prevent the sale of any objectionable milk.
3. Consequently inspection should begin at the place of production, and include the health of the animals, their stabling, feeding and breeding, as well as the manner in which the milk is obtained and treated.
4. Milk from various supplies should never be mixed.
5. All milk offered for sale should be subject to examination.

6. Veterinary surgeons on account of their studies and training are the persons best qualified to perform this work.

7. Milk should be transported in well-stoppered bottles.

8. No one should be allowed to sell milk unless licensed to do so.

9. Only by centralization, of the sale of milk, can these requirements be fulfilled.

10. In order to have efficient control the establishment of milk depositories or courts is required; these courts might be connected with the city abattoirs.

11. It is advisable that the municipal authorities take the whole milk trade into their hands.

Kenora, Ont., Dec. 29, 1909.

AMERICAN VETERINARY REVIEW, New York City:

DEAR SIRs—Please find enclosed Dominion Express order for \$3.25, renewal subscription for the REVIEW.

It is indispensable to me as I find it a valuable aid to me in my practice.

Wishing you every success for the year 1910.

I am, yours truly,

H. J. JOHNSTON.

San Jose, Cal., Dec. 27, 1909.

AMERICAN VETERINARY REVIEW, No. 509 West 152d Street,
New York City, N. Y.:

GENTLEMEN—Please find postal order in payment of subscription for the REVIEW; many thanks for the reminder. I have had it in the office for twenty-five years, and I cannot feel that I am doing business if I don't see the old familiar journal on the desk.

Yours respectively,

HUME A. SPENCER.

THE FUTURE POLICY OF THE PROFESSION.*

BY G. W. CLIFFE, UPPER SANDUSKY, OHIO.

We appreciate the privilege as well as the pleasure of meeting with you, a very formidable representation of the veterinarians of the great state of Ohio. In fact, we felt complimented upon the receipt of an invitation to be present and address you upon this particular occasion; to enjoy the discussion of the various subjects, many of which are of great importance to the future success of our profession. In our attempt to address you we wish to assure you that we will not offer any new ideas as to the future of serum therapy, nor shall we attempt to correct the fallacies of the old regime. But if you will indulge us we may improve the opportunity to speak briefly on, "The Future Policy of the Profession in Dealing with Economic and Humanitarian Principles and Their Application in Relation to the Public Health and Commercial Interests of Our Great Commonwealth."

This meeting is one of the annual events of this association, and as we gaze upon this assembly of professional men we recognize the faces of a number of its pioneer members; men who, inspired by higher ideals and the prospect of a bright future, organized this association more than a quarter of a century ago; men who have been entrusted with positions of honor and trust; men who have been responsible for the creation of your many instructive programs; men who have met often in the past at your annual events when there was scarce a quorum; men who first raised the standard of our profession in this state; men who, through their scholarly attainments and professional dignity, have so crystallized professional sentiment that, together with their associates, enjoy the distinction of one of the progressive professional bodies in our great commonwealth to-day; and may its future be not destroyed by the lack of personal interest, nor by discord through selfish motives of its members.

* Read at meeting of Ohio State Veterinary Medical Association, Columbus, January 12 and 13, 1909.

On the contrary, we should pledge each other to be magnanimous in spirit, faithful and true, that we may at all times be able to put out and keep out from our midst all contention that might threaten our existence as an association of professional men. Let us extend the glad hand to all, that united we may stand for the honor, dignity, and universal betterment of our chosen profession, as we believe that we can never attain to our highest and best in our profession or reach the goal in any of the more formidable avenues of progress or human activity until after we have learned to appreciate, appropriate and instill into our very lives the alkaloid of the fundamental principles of social ethics.

Here let us inquire, shall the future policy of our profession be progression along the lines of future scientific research, or shall we lower the dignity of the profession to that plain now occupied by the smart "hoss-swapper," or the professional "quack" in the practice of chicanery to secure a stray dollar? We contend that in order to maintain the standard raised by prominent men in the profession, we should be more dignified and more ethical toward each other, as well as to improve every moment in further qualifying ourselves intellectually in all scientific subjects relative to veterinary science.

The first veterinary school that we have any record of was founded in 1762, at Lyons, France. The first college in the United States to attract our attention was the New York College of Veterinary Surgeons, which was opened in November, 1864, with Dr. Liautard as its first professor of anatomy, operative surgery and clinics. I call your attention to these facts that you may better appreciate the great stride the science of comparative medicine and pathology has made within a very few years. We deem it befitting us on this particular occasion to bestow all honor upon those scholarly men who, by the results of their own ceaseless energies, carved the way that made it possible to plant the emblem of comparative and preventive medicine upon the highest pinnacle of professional science, that its emblazoned in-

scription might, as it were, shed the light of a new day over the whole world, bringing to the multitude hope and inspiring confidence of future relief. If we are to judge the future by the past—and it only seems fair and just to do so—we must expect that before the dawn of another century that the more intelligent and civilized nations of the earth will plead that those men qualified in the science of comparative pathology and medicine should be made guardians of the public health, as well as of the live stock interests of the world. To-day we ask ourselves: Are we fully equipped to meet the ever-increasing responsibilities that come with each succeeding year, and the fullest expectations of an exacting public upon all questions relative to the public health and economics in their relation and application to the live stock interests in our country?

It must soon appear to the general public that the veterinarian of to-day should be a scientific man, well versed in microscopy, bacteriology, comparative pathology, materia medica, hygiene, and many other subjects not necessary for us to mention. We are disposed to ask what, in your opinion, is the remedy, and how much longer will a patient people tolerate the "quack" and his dangerous methods in our own state of Ohio? We believe that such conditions will continue to exist until we are measured individually and collectively by public sentiment with the standard set up by the medical profession. We are pleased to acknowledge our obligations to the medical profession, for if it would but suggest to its clientele the necessity of legal protection against the expensive, dangerous and inhuman practice of the professional quack "hoss doctor," the whole people would be aroused to a full realization of the present condition of affairs and the importance of good and wholesome laws, not only for the betterment of public health conditions, but it would mean the saving of thousands of dollars worth of domestic animals each year. There would soon appear upon the statute books of Ohio laws that would meet the approval of the farmer and stock raiser, as well as the public in general. When the public receives such protection we will have been benefited.

In order that we meet the present requirements, the up-to-date veterinarian is expected to have his shelves filled with a full supply of the latest and best drugs, a complete line of hypodermic tablets, the different serums, anti-toxins and all the intravenous compounds requisite to combat the most acute and critical diseases. To be able to do this he should of necessity be a comprehensive student of pharmacology materia medica and of the practice of medicine.

We argue that the state of Ohio should equip and maintain a laboratory, where men of both professions could go if they so desired, to improve themselves in the various scientific subjects or engage in exclusive and special research work, as they saw fit. It would appear to us a step in the right direction. All the different immunizing serums, anti-toxins, etc., etc., could be produced and furnished for the use of both professions from this same plant which would mean the saving of thousands of dollars to the people of this state.

The people of this great United States have been blessed in the matter of national assets and variety of climate as no other country on earth in its great valleys and extensive plains of virgin soil, whose fertility and adaptability to the industries of agriculture and stock raising have challenged the admiration of all nations. Its vast forests and mountains of inexhaustible wealth, with the very bowels of our country belching forth, as it were, the fluids of the lower regions, and further stimulated by the world's centre of manufacture, has created an avaricious spirit, which has forced to the front that all-absorbing thought, "get the money." And in that grand scramble for wealth some of the more important economic questions have almost been lost sight of.

The services of the qualified veterinarian in relation to the public health and the live stock interests of the country are now rapidly and most surely becoming recognized as of great value to the nation, not only from the economic principle of commercial value, but also from that human principle that should always be present in the qualified veterinarian.

We believe that one of the greatest national assets is the soil, when utilized and cared for along those strict economic lines for the preservation of its fertility and adaptability to the wants and needs of future generations; and we would suggest to the present army of men now engaged in agriculture and the live stock interests to study more thoroughly the valued relations existing between the qualified veterinarian and the very best results that they may hope to attain from agriculture and live stock industries.

The inevitable change for the betterment of our profession is apparent, the public demanding the right to employ the qualified veterinarian wherever he may be found; and while our legislature at their last session failed to create the much-needed protection to the live stock interests of our great state, we accept their conclusions as a blessing in disguise, believing the future has many good things in store for the agriculturist and stock raiser, as well as the qualified veterinarian.

The day has arrived when men in all professions should be highly educated and well trained in their respective lines. Much more is the responsibility that rests with the student of veterinary science, that he may be able to intelligently meet all demands in the future made of him by the agriculturist and stock raiser, as well as to solve the many knotty problems which threaten the public health conditions, will most surely be his future province.

If his scientific education is based upon a broad and substantial preparatory foundation, the broader fields he will be able to master, and much greater will be his degree of usefulness to his country, and if it be true that we suffer the odium of that stigmatic term "hoss doctor," the cause must lie in the fact that our early education was most sadly neglected for want of better opportunities. But to-day we are proud to say that is not the condition of things, as the different universities and colleges for the education and training of the veterinarian, both in Europe and this country, rank high with similar institutions in all countries.

If you please, who is responsible for present-day opportunities? Surely not the empiric; far from it. This responsibility rests upon the heads of honored men of whom we would love to

speaking, but time will not permit. But you must permit us to name a few, perhaps most familiar to us. We first mention that zealous champion of our cause for years, the immortal "Bell," all honor to his memory; that courageous writer and teacher of the science of our profession, "Pearson"; that early advocate and instructor in the science as a profession, "Liautard." It would be wrong not to mention one of the fathers of our profession, "Law." With pleasure we mention that scholarly gentleman and diplomat, Dr. John G. Rutherford.

Gentlemen, such is the class of men responsible for the elevation and rapid advancement of our profession, men who have demonstrated to the world the value of the thoroughly trained veterinarian and his relation with economic and humanitarian principles, their application in relation to the public health, agriculture and the live stock interests. It appears to us that our cause will be sustained by an intelligent public without further evidence as to who has made the most brilliant discoveries in scientific research. What are they? How were they made? What for? And how will their application benefit the public generally? Suffice to say that many of the most brilliant and valuable discoveries of medicine and pathology made in recent years, have been made by the students of comparative anatomy, pathology and medicine, and should be a part of the veterinarian's knowledge of to-day.

We hold the various demonstrations to care for and discharge the newly recognized responsibilities that we find assigned to the veterinarian as the result of recent scientific research, entitles him to a full and implicit communion and fellowship with the medical practitioner, and no man in the medical profession is better equipped than the qualified comparative anatomist and pathologist to advise and direct all those preventive measures for the universal suppression of those contagious and infectious diseases depending upon the lower animals for their introduction or transmission to man; or that prove inter-communicable. This fact should settle for all time, the present relation the veterinarian sustains to the welfare of the public health.

Our profession is young; its rapid strides to the front in certain lines, the results of scientific research, has attracted the attention of the more intelligent of all civilized countries; but let us not forget the professional man, whom we are pleased to call our physician, who has been here for centuries. He is a fixture; society claims him as her own; the great and good service he has done and will ever continue to render the people of all nations, is beyond the comprehension of the most modern philosopher. Let us not speak lightly of his virtues, nor attempt to shear from him any of the honor, glory or renown he has so truly won; the result of faithful, heroic servitude and personal sacrifices. Let us cultivate his personal interest and favor, let us show him, let us demonstrate to him by diagnoses and post-mortem the accuracy of our methods in the detection of tuberculous cattle; let us explain to him our many advantages and opportunities for future research; let us call his attention to our relation in the matter of meat and milk as food products, and its inspection; let us remind him that one of the important duties of our profession is to instruct our clientele in the most approved methods of hygiene and sanitary measures in the production of all domestic animals, which must accrue to the financial interests of the producer, and assist materially in the humane endeavor in which we are all interested—the prevention of disease. Let us call his attention to our peculiar fitness, the result of special training to meet all questions of hygiene and sanitation as they relate to the welfare of the public health. He may then say to the public, “there are two professions to-day engaged in that noble and humane cause of life saving,” and assist us in educating society to give us a place at his right hand and laws that will sustain and protect us—is what we are asking to-day. The conservative policy of our worthy Board of Examiners is surely developing the line of demarkation in Ohio.

Gentlemen, we believe the searchlight of public intelligence is turned upon us as never before, and if we are able to meet all requirements indicated by the sign of the times, there is surely a bright future in store for the qualified.

And while under the gaze of public inspection, dare we be less dignified than men of other professions? Dare we be less gentlemanly and courteous toward each other and the public? Dare we be less indifferent in the selection of our associates in society? Can we afford to spend our spare moments in public places of loiter, or had we better devote such time to our books or something commendable? Gentlemen, can we afford to place the dollar above the principles of professional ethics? We believe that the status of our profession in society depends upon the personnel of its members; the people render the verdict; are you ready for it?

We respect the motto of our association—Fraternalism—and its policy—Progression—with a firm resolve in the future to be strong enough to eradicate from our midst any unkind feeling or thought against a member. Be dignified as professional men, but courteous and fair to the public, that our efforts will be commendatory to the people. Being personally interested in the elevation of our profession to a high and dignified position with all honorable professions, to that end we offer our best efforts.

LOCAL MEN INVENT POTATO MACHINE.—A potato cutter and planter has been invented by Dr. Mark D. Williams, the well-known local veterinary surgeon, and Ernest Brown, and application has been made to the Washington patent office for a patent upon it. It promises to make a material saving of labor to the farmer who is engaged extensively in potato raising.

The machine will be drawn by two horses and will cut and plant potatoes as fast as the horses can walk without making any skips. The potatoes will be cut from end to end, thus dividing the seed end, and will plant at any intervals the operator wishes to set it. One or two potatoes or pieces of potatoes can be planted in a hill, this being optional with the operator.

The inventors are deserving of considerable credit for their accomplishment in inventing this device. Dr. Williams, who is one of the best known veterinaries in the state and nation, has always taken an interest in the development of agriculture and particularly horticulture.—(*Middleport Herald, Middleport, N. Y.*)

A PRACTITIONER'S EXPERIENCE WITH ECHINACEA.*

BY D. D. LE FEVRE, D.V.M., NEWARK, N. Y.

At the various veterinary meetings that I have attended I have sometimes talked with different veterinarians about using echinacea and what results they have obtained. From the answers they have given me I conclude that the drug is not used very much in general practice. Some have answered that they did not know what kind of cases to use it on. Here I would say use it anywhere and everywhere, where everything else has failed; use it where you have no hopes of a recovery and see how it will surprise you. There is a whole lot about what slip in nature allows disease to take hold of one individual and allows another to escape; why some recover, others do not; although so far as we can see, each may have just as good a right to stay well, to become sick, or to get well as the other; why one colt of a drove of eight or ten should have an irregular form of strangles, be covered with large abscesses and probably die, while in the others it follows the regular course and they get well quickly. For a moment think of the wonderful cure of parturient paresis and who can explain it! So there are many things about disease that we do not just understand; also, the obscure action of some drugs in curing disease we can not explain. One of those drugs that we know the least about how it acts is Echinacea Angustifolia, and yet I have seen some of the most marvelous cures effected with this drug.

In 1904 Professor Fish issued a bulletin giving the history and telling us about its uses, action, and chemical combination; and relating a number of experiments that he had made; so I will not take time here to dwell on those points, but will proceed to report some cases giving an idea of what cases I have found it most applicable to.

* Read before the twentieth annual meeting, New York State Veterinary Medical Society, Ithaca, August, 1909.

1. May 5, 1904. Gus Orr called me to see a five-year-old black cow dry at pasture; pregnant six or seven months; paralyzed, drawn home on a stone-boat; apparently same kind of case as parturient paresis, except no tendency toward coma; patient eats a little; is bright in appearance, but will not stand up or even try to; pulse and temperature normal. For seven days I poured down that cow's throat every kind of medicine that I could think of; tired myself and owner both out raising her up and down with slings, and both of us had made up our minds that it was all off with the cow, and he was asking me to kill her. At that time temperature was 105, pulse 90, respiration about 70, inhalation, decubitus, or some other kind of pneumonia was present; going to die. I persuaded owner to get two pounds of powdered echinacea and give her three ounces every four hours. The next morning the owner 'phoned me the cow was up walking around the yard eating. I get from two to four of these cases a year and find that the drug in large doses acts like a specific; perhaps the treatment for parturient paresis would do as well.

2. May 4, 1908. Called by Bert Gravell to see cow seven years old. Jersey, new milker, in fine condition, giving large mess of milk, till May 2 when she was out in a cold rain storm all night. On the third he noticed she was sick and on the fourth he called me. I found the cow shivering, trembling; temperature 106, pulse 80, breathing rapid; head drawn upwards; mucous membrane of eye blood-shot; animal which was previously docile is now very nervous and if handled becomes very much excited, jumps in manger and rams around in stall till it is dangerous to handle her. Occasionally if not disturbed owner tells me she becomes quiet and may try to eat a little. It is noticed that she is partially blind. Diagnosed cerebral meningitis. From the fourth to the eighth, patient constantly grew worse, in spite of pounds of salts, nitrate of potash and bromides, some arecoline, and chloride of barium, and other things. On the eighth cow is totally blind, cornea completely opaque, or rather bloody; bulges out as if eyeball would burst. Seems to try to stand on tip toes; is in a constant tremble; head drawn up; nose poked in corner of

stall against wall; is crazy; dangerous to try to give medicine; trembles so she shakes floor; temperature still 106; respiration stertorous, can hear her out of doors; could not take pulse; owner begs me to kill her. I persuade him to get one pound of echinacea and give one-quarter pound three times a day; next morning owner 'phoned me cow was much better; medicine was continued and in two days cow was out in yard grazing and in about two weeks the eyes cleared up and she came back to her milk, making a complete recovery.

3. November 10, 1907. W. J. Swartz attempted to remove the placenta from one of his cows. November 18 I was called. I don't think I need to describe her. You have all seen and smelled lots of just such ones; gaunt arched back, staring coat, straining and passing a little fetid pus every few minutes; refuses food; high temperature and so forth; from the 18th to the 23d that cow received all kinds of dope, including nuclein, tallianine and calcium sulphide, gentian, nux vomica, nitrate of potash, and several kinds of injections, and she grew constantly worse till on the 23d she is nearly ready to die; refuses food entirely; has to be helped up and is a picture of misery. I persuaded owner to get echinacea; gave four ounces three times that day; next day she began to eat a little; medicine was continued, and in three days she was eating everything she could get to, and soon made a complete recovery and gave a good mess of milk.

4. May 4, 1904. Called by J. B. Dickerson to see bay mare six years old in good flesh; fine roader; she is in a box stall; eats sparingly; seems in pain; gets up and down; acts uneasy; temperature 105; legs sore to touch; acts stiff; walks lame all over. May 7, abscess of flexor tendon bursa at hock joint is opened; May 9, one on left hock; next day, one on front leg at knee; some at fetlock; all forelegs are affected and almost every flexor tendon sheath suppurates; also abscess on flank and chest are lanced. For a period of ten days, I think, an abscess was lanced almost every day. On May 18 animal was gotten out on a paddock back of barn out of sight where she could be buried. She was a sight to behold; sores all over; could see the hip bones bare; but she, being

a fine horse and a pet of the family, we began giving echinacea in large doses internally and washing sores with echofolta and dusting on powdered echinacea. In three days she could get up alone and was eating good. I never saw sores heal so fast in my life. In a very short while horse was working, completely recovered.

I might go on and mention any number of cases where it has given me the finest kind of results, but these will serve to give an idea of what kind of cases I have used it in. I always use it in poll-evil and fistulous withers both internally and externally, and have the finest kind of results.

I love to doctor those cases because they are easy jobs for me. I always get a good cure and a pleased client with but little work and a good fee. Why, I could not keep house without echinacea. I generally let the owner buy it as it is too expensive for me to furnish.

MEDIATE AUSCULTATION.

I have often wondered why the *mediate* form of *auscultation* (*Laennec*) has not been more fully made use of by the veterinary profession.

It appeals to one in the matter of gaining more accurate knowledge of each individual case—shutting out so much of the surrounding disturbances encountered, especially where numbers of cows are confined in one place—as well as too many gossiping bystanders.

With practice, I am sure no one would discontinue it when acquainted with its advantages, to say nothing of its appearance, from a professional standpoint. Now that physical diagnosis means so much, in the examination of bovine tuberculosis alone, it seems a good time to begin this method also.

Then, I think the majority of cases can be more positively stated, "as not having the specified disease examined for," to quote the words of a member of the recent conference at Ithaca; and I think this would be largely the answer to his question and the means by which such verdict can be derived.

When every outfit contains a phonendoscope, or even a stethoscope, conscientiously used, less guesswork and a more satisfactory decision to all concerned will be attained.

C. J. MULVEY, D.V.S., Mooers, N. Y.

URETHRAL CALCULUS OF THE OX.*

By H. L. STEWART, LACONA, IA.

My reason for selecting this subject is because I believe it has never been brought before this association for discussion, and in my opinion is a much more common ailment than is usually supposed; and in many cases the trouble is not properly diagnosed, owing to the fact that such a very small calculus is the cause of the trouble; and speaking from personal experience is often diagnosed as some other disease and treated as such, till the case terminates in death. I am frank to say that I did not always diagnose it the same, or treat it the same, but usually got the same graveyard results. And one reason I so readily acknowledge my mistaken diagnosis, is because I have been called in consultation several times and I found that other practitioners were making the same mistake that I had made, and I have often wondered what the experience of other practitioners was with this trouble; and I have been unable to find much literature on this subject, and that is what prompted me to write this short paper.

I do not believe any of us have ever overlooked this trouble in the horse, owing to the urethra being so much larger, especially near the meatus, and will accommodate a so much larger calculus that it is easily diagnosed; but with the ox a calculus weighing two or three grains will cause very serious conditions, and produce death, owing to the peculiar S shape of the urethral canal, that it is a very easy place for them to form or lodge and very difficult for them to pass them. The calculus is usually found at or near the curve in the urethra, yet does sometimes form near the meatus, and may form any place in the urethra. The symptoms of the disease differ somewhat in different cases and that is why it is often diagnosed as different diseases.

* Read before the Iowa Veterinary Association at Fort Dodge.

The animal is usually found lying down and when made to get up, will elevate the tail a little, as seen when urinating normally, and usually from one or two to a dozen drops of urine will be seen to dribble from the point of the sheath for the first day or two, and in some cases a drop will be seen to fall about every ten seconds, but in many cases there will not be a drop of urine seen. In many cases the animal will be seen to kick at the belly as sometimes seen with abdominal pains and the usual constitutional symptoms of an ox in pain are present. Some have a little elevation of temperature, and a slight diarrhoea, a peculiar stamping of the feet as if they might itch is not an uncommon symptom. Where there is not too much swelling, and the animal is not too fat, by passing the hand along the urethra, the calculus may be located; as it is very painful to the touch, and when located by the pain evinced, the calculus, though very small, usually about the size of a kernel of barley, may be felt by carefully feeling for it. There is usually more or less swelling, and in some cases the swelling is enormous; sometimes swollen the entire length of the belly, and half way up the sides of the animal. In some cases suppuration takes place and sloughs through the urethra, and allows the urine to escape underneath the skin, and I have seen not less than five gallons of urine escape as soon as an incision was made through the skin, and yet find the calculus slightly imbedded in the urethra just anterior to the opening made by the sloughing; I have met with several cases of this nature.

In some cases they slough through to the outside, forming, so to speak, a new urinary meatus and opening into the sheath, and the animal voids his urine through the opening thus made, and seems to do fairly well for a while. I have seen two cases where, after the animal had made a partial recovery, and the opening produced by the sloughing had almost closed up, the urethra become distended and form a receptacle, in which a large number of calculi ranging from the size of a kernel of wheat to as large as one or two kernels of corn, forming a mass two and a half inches or more in diameter. Yet, while there are a few

that recover in this way, there are but very few that recover without being operated on.

Until the last couple of years I have always operated for the removal of the calculus; usually operating just anterior to the scrotum, and after removing the calculus found there was so much inflammation that the urethra was swollen shut; and in several instances amputated the penis, then made another incision just posterior to the scrotum, and found the same condition. I have several times amputated the penis here owing to a partially gangrenous condition, then made an incision just inferior to the anus. But for the past two years I have not operated for the removal of the calculus except in a few cases to convince the owner that I was right in my diagnosis; but usually make an elliptical incision just inferior to the anus, about three inches long and about one and a half inches wide, then make an incision in the urethra about one and a half inches long, and the urine usually spurts out, but if it does not I catheterize the animal then with a linen suture, suture the divided edges of the urethra back to the skin. Of course the ordinary antiseptic precautions should be used. I have never used much after-treatment and have gotten the best of results, and have never seen any bad results from leaving the calculus where it was, and the animal seemed to thrive as well as if nothing had been wrong.

THE Society of Comparative Medicine of the New York State Veterinary College, will hold its annual banquet at the Ithaca Hotel, Thursday evening, February 24th.

DR. JOHN SPENCER, of Pulaska, Va., has accepted a position on the staff of the University of Wisconsin, at Madison, as "Lecturer in Veterinary Science," to long course students.

A SECOND hearty welcome from the Pacific Coast comes from the President of the Southern Auxiliary of the California State Veterinary Medical Association. Read it under head of correspondence on page 604 of this issue.

PROTARGOL AND ITS USE IN PURPURA HAEMORRHAGICA.*

By R. H. KINGSTON, D.V.S., NEW YORK CITY.

On the first of October, 1905, I started to use solutions of Protargol in the treatment of Purpura Haemorrhagica, and I believe I may claim priority in the intravenous use of this drug in this disease in New York City. The discovery of its use was accidental; at the time I was using a five (5%) per cent. solution as an injection for a horse with synovitis. In the same stable I had a green horse with purpura and after the disease had developed to such an extent that the horse appeared to me to be beyond recovery, I gave him a hypodermic injection in the neck of 40 c.c. of a five per cent. solution of protargol and at the same time put in a tracheotomy tube, as the horse was suffocating. By the afternoon the neck on that side was swollen from his head to his withers and I then injected 40 c.c. of two and one-half per cent. solution on the other side of the neck. The next morning both sides of the neck from the withers to the head were greatly swollen, but the horse appeared to be no worse. I then started to give the horse intravenous injections of 60 c.c. of a two and one-half per cent. solution twice a day, rather expecting fatal results. This treatment was continued for a week and the animal made a rapid recovery. There was no sloughing due to the hypodermic injections in the sides of the neck.

As I frequently have cases of purpura haemorrhagica in the green horses that are undergoing or following their acclimating sicknesses I use solutions of protargol exclusively in the treatment of this disease, the dose varying from 30 c.c. to 60 c.c. of from two and one-half per cent. to ten per cent. solutions, once and twice a day. If the horses are swollen around the nostrils I use cold showers and in several animals I had to insert tracheotomy tubes, but used no other medication on any of them. I also experimented on normal healthy horses to determine the maximum dose, if possible. A number of horses were given 60 c.c. of a

* Read before the Veterinary Medical Association of New York City, November 3, 1909.

ten per cent. solution three times a day with no apparent ill effects. Other horses received 60 c.c. of a ten per cent. solution before starting to work. How much a normal horse will stand I can not state as 60 c.c. three times a day is the largest quantity I ever used on any horse. Two and one-half per cent., five per cent. and ten per cent. solutions of this drug were used on a number of horses affected with purpura; over ninety per cent. of them making a complete and rapid recovery, and in none of them was there any sloughing away of the tissue. The records kept in these cases show that about ninety per cent. recovered and the ones that died had other complications. One horse died suddenly after he had made a complete recovery, had been exercised and got ready to work. I was unable to hold an autopsy on him, but he had not received any protargol for over two weeks.

The strength solutions that give the most satisfactory results are two and one-half per cent. and five per cent. used twice a day, the dose at each injection ranging from 30 c.c. to 60 c.c. This solution should be used intravenously and the solution made up with cold water, distilled preferred. The solution keeps better if made up cold, and I make up enough at a time to last for two or three days' treatment only. I never warm the solution before injecting it into the jugular vein, but no doubt it might be an advantage. The two and one-half per cent. of solution seems to give as good results as the five per cent. solution, but, although the ten per cent. can be used without any bad results, I would recommend the weaker solutions.

In a majority of the cases of purpura where I used this drug, the treatment was kept up from three to six days only. It is needless for me to describe the symptoms of this disease, but, in connection with them, I would say that I noticed in some cases that the great oedematous swellings would almost all disappear over night. At first I looked for a fatal termination, but found later that this does not call for an unfavorable prognosis.

I persuaded a number of the members of this society to try the treatment, and I believe they have had about the same results that I have had.

HORSE SHOEING.*

By DR. W. H. ROBINSON, WOODSFORD, ME.

In fulfillment of my promise to your secretary to prepare a paper on the shoeing of interfering horses.

Interfering is a subject which a veterinarian is often called to treat. There are many kinds of interfering, but those of which I will speak about are knee-hitting, shin and ankle-hitting, these being the principal ones. You can take a horse from pasture and leave his feet alone with all the wings on them, not leveling them up to suit the eye, and drive on your shoes, and I have never seen one of them that would hit after he was shod. But when the horse-shoer begins to rasp and make the feet smaller, and then change the action of the feet, this is when the trouble commences. Nine out of ten horses that interfere wear their shoes away on the outside portions, which indicate clearly that the horse's foot is not balanced on its leg, and shows further that the part of the foot that comes in contact with the ground is the first side that wears away. That is the high side; for if the foot was balanced it would wear both sides alike, although standing with the foot on the floor, and as looking at it you could measure the inside part from the coronary band down to the ground surface and find that it measures the shortest, while the outside part of the foot may to the eye seem to be the highest; while in reality it is the longest, and the shoe is found worn away on the outside part the most. This shows very plainly that the foot is high outside. Floor-men as a rule, cannot balance the foot correctly because of the way that they hold it when dressing it. Instead of beveling the foot to suit the joints by picking it up and holding the metacarpal bone and letting it hang in a proper position, they catch it between their knees and twist it to suit their eye and not the joints. Most of the horses that interfere are the toe-wide or base-wide, sometimes called "nigger heel." Nigger heel

* Read before the Maine Veterinary Medical Association.

horses are, as a rule, bad interferers and generally hard to cure. The toe-wide kind will be found wearing their shoes on the outside, where the greatest body of the foot is found to be. When you get a horse standing in the correct position, which is, to have his foot equal on both sides, he is very seldom found to interfere; he will break over the toe straight on the shoe. In shoeing interferers I generally put on a straight toed shoe, which assists in this square breaking over movement of the foot. This in itself has a tendency to cause the horse to carry the foot and limbs more correctly in line with the body. In shoeing the toe-wide foot it is necessary to try and turn the toe in, making it of the pigeon-toed variety; or the reverse of this is the rule to follow in case of the horse that toes in, thus giving the foot a chance to break straight at the toe. In shoeing a faulty-gaited one of the interfering type, the shoer must always see him in action before he starts to shoe him. A view should be taken of the horse both going from you and coming towards you. Another point of great value is to drive the horse on moist ground, so as to see the prints of the shoe and learn how he breaks over, and if he breaks or rocks over the inside, the toe may be extended over the shoe so that it will force him to break over more squarely. If calks are being used, the toe calk can be extended over that portion. I would suggest, in shoeing the pigeon-toed variety, that you work directly opposite to the way that you would on one of the toe-wide position, by taking away the inside toe of the foot and extending the shoe over the outside, with the outside heel of the shoe fitted close to the inside, and sometimes fitted full and extended over. As a rule the pigeon-toed do not interfere, and if they do, it will be found that they hit generally with the inside toe. The driving helps out a good deal; if a horse is driven properly and is not jerked to one or the other side, pulled around corners or pulled up too quickly; as it deprives him of the full use of his head, and has a bad influence on his trouble. Weakness is another cause of interfering in horses, by their not having strength to carry their limbs, no matter how lightly they are shod; and the tendency is that they are likely to

interfere when overdriven. Many times the owner will dictate how he wants his horse shod; most times whether right or wrong and will not listen to an opinion. Horse shoeing is a mechanical art and not a roughly hewed work, which some men think who know no better, but it is a fine mechanical calling and men must understand the responsibility of their calling.

DRS. GLOVER, Newsom, Kaupp and Barnes attended the State Veterinary Association Meeting held in Denver recently.

THE local meat inspection force under the management of Dr. Busman gave a pathological exhibit to the meat inspection class of the Veterinary Department of the Colorado Agricultural College during the stock show in Denver early in January.

It is generally conceded that there is much more tuberculosis prevailing among the flocks and herds in Great Britain than in this country. The annual report of Mr. A. M. Trotter, V. S., to the Corporation of Glasgow, Scotland, bears out this contention. Some 57,751 of home-fed cattle were slaughtered in Glasgow last year and 9,614 head were affected with tuberculosis; that is over 16 per cent.. Of these, 1,158 carcasses were totally destroyed. There was a total of 35,387 head of foreign cattle slaughtered in the city and only 520 were affected, or 1.48 per cent. Of those affected, only 8 carcasses were totally destroyed and 21 partially.—*Live Stock Journal*.

If the appealing picture of the four little daughters of New York, requesting Mayor Gaynor and Park Commissioner Stover from the back of their surrey to "please * * * let the automobiles go up Fifth and Eighth avenues, so we can drive our ponies in Central Park again," as published on the front page of *The Rider and Driver* of January 22, were but heeded, as it should be, what a step toward a restoration of "the peaceful life" would be taken. If anyone had predicted fifteen or twenty years ago that any mechanical appliance would some day be allowed to literally plow up and destroy the roads in Central Park, which were the pride, not only of New York City, but of the entire country, and convert that beautiful, shady, flower-perfumed retreat into a dangerous, oil-besmirched, malodorous pandemonium, he would have been considered a fit subject for the "funny house"; and yet that is exactly what has taken place. Let us echo the request of the dear little ones in the surrey; please Mr. Mayor and Mr. Commissioner, use your good offices to correct this evil.

LIGHT AND VENTILATION.*

By D. H. UDALL, D.V.M., ITHACA, N. Y.

Consideration of the air in its relation to health involves a study of the constituents of the air (gases, dust), the physical properties of the atmosphere, the weather and the climate.

The following constituents are of great hygienic importance:

Oxygen 20.7 per cent.

Carbon dioxid .03 per cent. (3 parts in 10,000).

Water vapor variable.

Ammonia, nitric acid, nitrates, dust.

In quiet breathing from 2.5 per cent. (horse) to 5 per cent. (man) of the inspired oxygen is used. This unites with the hemoglobin, and chemical union occurs even when the amount of oxygen in the air is reduced 50 per cent. Less than this amount causes rapid breathing and an increase in the frequency of the heart's beat. The effect of continuous breathing of air poor in oxygen has not yet been determined. Variations in the amount of oxygen in the air of different localities are too slight to possess hygienic importance.

Carbon dioxid varies in amount in the free air. There is an average of 3 parts in 10,000 in the country to 3.7 parts in 10,000 in cities. In living rooms where there are no active currents the amount is as high as 1 to 2 or even 10 parts in 1,000. The sources of carbon dioxid are the breath of animals (cow and horse 100-125 liters per hour), decomposition of manure, oxidation of gas and fuel. It is removed from the air by plants, rain, and chemical union with organic matter. It serves as an index to the degree of impurity of air and is therefore of great hygienic importance. This gas alone is rarely present in amounts sufficient to cause acute poisoning. In combination with other

* Presented to the twentieth annual meeting, New York State Veterinary Medical Society. Ithaca. August, 1909.

gases that are formed with carbon dioxid it acts as a depressant. Continuous inhalation of these gases lowers the nutrition and tone, respiration is depressed, the lungs are poorly aerated, and the animal is more susceptible to infection.

According to Pettenkofer the air in living rooms should contain not more than 10 parts of carbon dioxid in 10,000. According to several European writers on veterinary hygiene stable air should contain not more than 30 parts in 10,000.

WATER VAPOR.—The temperature determines the amount of water that may be retained in the air in the form of vapor.

At zero Centigrade this is 4.876 gm. $4.876 = 100\%$.

Cbm. at 20° Centigrade this is 17.18 gm. $4.876 \text{ gm.} = 28\%$. Percentages refer to the relative amount present. Water of condensation in a stable indicates that there is a relative moisture of 100 per cent., that is, the air is saturated and the excess has formed as water of condensation. The absolute amount of moisture in the air is greater in summer than in winter, but the relative amount is greater in winter. The per cent. of moisture is highest in the morning and lowest between two and four in the afternoon. The amount of water vapor in the air is of great hygienic importance. Its sources are the same as those of carbon dioxid (breath of animals, decomposition of manure), and like C.O.₂ it is an index to the vitiation of the air. By some investigators the determination of water vapor is considered of more importance than that of C.O.₂, this is especially true of stables.

Saturation with high temperature leads to saturation of the brain or lungs with heat stroke. Saturation with low temperature induces heat radiation and it is more difficult to maintain the body warmth. Stable air in winter often contains too much moisture (95 per cent.). Remaining permanently in such a saturation is detrimental, the animals become depressed, tone, nutrition and resistance are lowered, refrigeration and respiratory diseases occur. Moist air is a better medium than dry for the sporulation and vitality of pathogenic organisms, and in such an atmosphere the course of disease is always prolonged. Under

hygienic conditions with a temperature of 65 to 70, Fahrenheit, the moisture is from 40 to 70 per cent.

Ammonia, due to the decomposition of urine, is sometimes present in stable air to the extent of 1 part in 1,000. Its effect is that of an irritant to the mucous membranes.

Dust may be so prevalent as to cause mechanical irritation of the air passages. Its principal danger is as a carrier of germs. One cubic foot contains on an average of 20-40, 4-8 of which are bacteria, the rest fungi. The germs arise from the ground, the skin and mucous membranes, clothes, etc. They are not carried into the air by expiration or from moist surfaces by means of evaporation. Small drops carrying germs may be carried into the air by coughing or sneezing, where they may remain for a long time, especially in stables where there are few currents. Most of the germs in the air are harmless. Pathogenic organisms, with the exception of those that form pus, have not yet been found in the free atmosphere. It is safe to assume that diseases are rarely transmitted through the free air. This is due to the dilution of the air and the effect of light and dessication as disinfectants. In closed rooms infection through the air more readily occurs, especially when diseased animals are excreting pathogenic organisms. This appears to be true of tuberculosis of the lungs, nasal and lung glanders, and influenza. A portion of the infected drops may be taken in with water and food, masses may dry and infection be carried into the room a long time afterwards in the form of dust. Infection by means of drops and dust is overcome only by disinfection, currents of air are insufficient.

VENTILATION.—When animals are kept in a room that is closed on all sides the air gradually becomes stale from the consumption of oxygen by animals and micro-organisms; contamination by C.O.₂ and other offensive gases arising from the intestines, skin, manure, etc.; water vapor from animal exhalations, food, water, urine and manure. Good stable air contains about 1,400 bacteria and 200 fungi per cubic foot, under poor conditions these may be increased 10 to 15 times.

Remaining continuously in vitiated stable air reduces the nutrition, blood-formation and resistance, disease spreads more rapidly and the attacks are prolonged. It has often been observed that the introduction of good ventilation has reduced the sick-rate and mortality and stimulated the functions. In this connection Dammann has referred to a stable containing 80 well-fed Swiss dairy cows in which the installation of a good system of ventilation increased the yearly output 483 quarts under identical conditions of feeding. The condition of the milk is also affected by ventilation. If a constant change of air is not practical it should be effected not less than half an hour before the time of milking.

In determining the requirements of ventilation it is customary to consider the gaseous impurities of the air and in many cases this is confined to the amount of C.O.₂ which is used as an index. Where cattle and swine are kept it is essential to determine the per cent. of water vapor, and in horse stables to estimate the amount of ammonia. The water vapor should not average more than 40 to 60 per cent. The maximum amount of C.O.₂ should not exceed 2 to 3 parts per 1,000. Stable air containing more than 3 to 1,000 is vitiated.

The hourly exhalation of C.O.₂ from domestic animals is about 300 cubic centimetres per kilogram of body weight, it varies with the food and temperature. In a stable of 10 cows weighing 400 kilograms (800 pounds) the hourly production is about 1,200 liters (42.37 feet).

Stable air contains 3 parts C.O.₂ per 1,000.

Fresh air contains .3 parts C.O.₂ per 1,000.

1,000 parts air absorb 2.7 parts C.O.₂ hourly.

1 liter air absorbs 2.7 c.c. C.O.₂ hourly.

1,200 liters C.O.₂, hourly production of 10 cows, absorb 444,444 liters (15,693 cubic feet) of air hourly, the amount of air necessary to provide 1,000 parts of air to 3 parts of C.O.₂. After providing for the other sources of C.O.₂ it will require from 1,588 to 2,471 cubic feet per hour per cow. With a good system

of ventilation the air cannot be replenished more than twice or three times hourly so that each cow should have not less than 600 to 800 cubic feet of air space, that is, a half to a third of the air required each hour. With less active ventilation, the usual conditions, the space should be greater.

SYSTEMS OF VENTILATION.—The forces controlling changes in the air supply are variations in temperature, currents of air, and diffusion. The last of little practical importance. Ventilation through incidental or accidental openings is not easily controlled. When there are few currents of air in motion it is not sufficient, during a storm the animals may be exposed to drafts. Natural ventilation is far from ideal.

Artificial ventilation must provide for three things: 1. A supply of pure air. 2. Free circulation through the intakes and exits without exposing the animals to drafts. 3. The circulation must be continuous and easily regulated. Fresh air must reach the animal in abundance and preferably in the region of the head; it should be brought in through shafts made for the purpose, rather than through windows and doors.

To provide for a complete circulation the intakes and exits should be widely separated. Drafts are prevented by taking the air in through several small openings.

The value of any system of ventilation depends upon currents of air induced either by the wind or differences of temperature.

These two sources have disadvantages in being inconstant and in hot quiet days in summer their action is suspended.

According to the direction of the currents of air ventilation is termed horizontal or vertical. Horizontal ventilation is sometimes seen in dairy barns in the form of round shafts passing through the wall just beneath the ceiling. It is better to have the shafts bent at right angles and pass for three or four feet in the wall as nearly as possible to the inner surface. This provides breaking the current of wind and the air is slightly warmed as it passes through the shaft. By passing upward it is mixed with the warm air of the stable before coming in contact with the animals.

Air may be brought in through a shaft that has its origin near the ground, passes through the wall and underneath the floor and is carried through the floor near the manger. This form is best used where the animals stand with the heads directed towards the middle of the stable. One opening is provided for every two or three cattle. In horizontal ventilation the wind is the principal factor in the regulation of the supply. The air enters from the side toward which the wind is blowing, mixes with the warm air and leaves through shafts on the opposite side. The principal disadvantage of a horizontal system depends on the fact that its action depends entirely on the wind, and that when the wind is still there is no ventilation.

Vertical ventilation is provided for by means of shafts which open in the middle of the ceiling and pass directly upward through the roof. These shafts are from six to twelve inches in diameter; when larger than this they may create drafts, collect water of condensation, or fail to operate. The shaft may be constructed with four passages by means of partitions. They should be lined with smooth boards, and are improved by a covering of building paper and another layer of boards. The shaft should be surrounded by some non-conductor of heat (chaff, straw, sawdust) to prevent cooling of the air in the flue, this adds to the efficiency of the system and prevents the formation of water of condensation. Dampers should be placed in the flue to control the currents. For six to eight large cattle estimate four inches of diameter (Klimmer). Others advise a flue about one foot in diameter for every ten cattle. This shaft serves only for the exit of the air. Fresh air is supplied through some form of horizontal system. Differences in temperature between the internal and external air usually provide for abundant currents except in very warm sultry weather.

Various means are employed to utilize the wind in increasing the efficiency of the system.

1. Aspiration attachments.
2. According to Muir the shaft is divided into four compartments, the dividing walls are carried above the outer walls

so that the wind exerts suction on the windward side and enters the shaft on the opposite side. According to Muir the total diameter of these flues is about ten inches, and one shaft is used for every twelve cows.

Schreider uses a system by which the intake enters at the top of the stable. Holes about one-half inch in diameter are placed in the intake shaft, which passes entirely across the stable, this prevents the formation of drafts and allows the cool air to sink down into the warmer air. The outlet is brought to within twelve to fifteen inches of the floor to remove gases arising from the bedding. Use one set of shafts for every ten animals, each shaft being about fourteen inches square.

The Humanitarian and Nature Student and Our Animal Friends is the new name of the little paper we have been used to knowing as *Our Animal Friends*. That is not the only change it has made, however; it has changed the color of its cover to a shade of green, suggestive of nature, and enlarged the magazine very materially. The February issue has a number of very interesting articles beautifully illustrated. Altogether it has taken on an appearance of importance in the field of literature, and we prophesy a successful future for it.

HOLYOKE, MASS., Dec. 27, 1909.

Editors AMERICAN VETERINARY REVIEW, 509 W. 152d street,
New York.

GENTLEMEN—Enclosed please find check for \$3.00 for renewal of my subscription. I first subscribed when in college; and the sooner the students realize the benefit of the REVIEW, the better off they will be, for there are reports of cases, etc., that are worth discussing with a body of students.

Thanking you for your past favors,

Yours very truly,

W. C. VAN TASSEL, M.D.C.

REPORTS OF CASES.

A NEW TREATMENT FOR FISTULOUS TRACTS AND ABSCESS CAVITIES.

By Dr. C. A. LESLIE, Deadwood, S. D.

In offering this article to the profession, I do so with the firm belief that I have discovered a course of treatment that is specific in the treatment of fistulous tracts of all kinds, and, having used it in a great many cases with such marked success, I feel justified in making the above assertion.

Surgery has done more than any other method so far, however there are a great many methods of treatment now in vogue, and each one has its merits; but there still remains a class where the ramifications are so extensive that it is almost impossible to get a healthy granulation of the various tracts, and so with each successive operation undertaken the veterinarian hopes to achieve a cure, only to meet with another disappointment.

In the interval of these operations, irrigation with antiseptic solutions are kept up, and it is now my opinion that irrigating these chronic fistulous tracts with any watery solution is to be condemned, for the fluid fills up the sinuses and keeps their walls in a macerated condition, which has a tendency to prevent formation of healthy granulations. If at all possible, I would advise drying these cavities out with strips of gauze. If the latter is impossible an injection of alcohol may be used on account of its desiccating property.

The new method of treatment is quite simple and consists of filling the fistulous tract with bismuth paste. I wish to give the history of some of the cases I have treated with the paste, and the results. However, I will first speak of the method of injection and give the formula for the paste:

(Formula of Paste for Treatment.)

Bismuth Subnitrate	30.0 Grammes.
White Wax	5.0 Grammes.
Soft Paraffin	5.0 Grammes.
Vaselin	60.0 Grammes.
Mix while boiling.	

It will be found convenient to get eight times this amount, and then, after placing the last three named ingredients into a quart Mason fruit jar, which is perfectly dry and sterilized, place the jar in cold water, letting it reach the boiling point, and boil until the contents are melted; then add the bismuth while stirring. Allow all to heat for some time. (Great care should be taken that no water is accidentally spilled into the paste while boiling.) The jar can then be removed and the lid screwed on tight, and contents shaken until it is cool; it is then ready for use at any time after it is again melted.

Method of Injection—The paste should be heated and sterilized, also the syringe. The fistula should be dried out with sterile gauze until it is as dry as it can be gotten. I use a strong metal syringe for the injection. The fistula is then filled up with the paste, making sure it is forced to all parts of the tract. The opening is then plugged with a gauze sponge, and it will be found convenient to stitch same tightly in the opening to prevent the escape of the paste until it has hardened. An ice bag may be used to hasten the hardening process. The theory is that the solid substance acts as a framework for the formation of the healthy granulations. If the injection has been successfully done, the external opening will heal in a few days, and later the bismuth-vaselin is undoubtedly absorbed and the connective tissue remains and contracts, thereby obliterating the sinus.

Dr. Emil G. Beck (M.D.), of Chicago, surgeon to the North Chicago Hospital, is the discoverer of this treatment, and it was from a small booklet published by him entitled, "A New Method of Diagnosis and Treatment of Fistulous Tracts, Tuberculous Sinuses, and Abscess Cavities," that I conceived the idea of using it in fistulous withers, etc. He first used it to diagnose the tracts by taking a radiograph after an injection of the paste. As he could get so much clearer a picture with its use, as the bismuth offers great resistance to the penetration of the X-Rays. However, the first case injected for diagnostic purposes disclosed the new method of treatment. After one single injection of the bismuth paste the fistula (rectal) closed up and remained so; and he has obtained equally good results in many other cases.

Case No. I.—On April 17, 1908, a white gelding was shipped to me for treatment. The fistula, in centre of neck on left side, had existed two years, and had been operated on unsuccessfully several times. I operated on the animal, with no satisfaction,

on four different occasions. I kept on treating the case until finally I procured one of the above-mentioned booklets, and immediately tried the paste, and in just eleven days the animal was well, and has remained so to this date.

Case No. 2.—August 30, 1908. Bay mare, poll-evil had existed three and one-half years. Dried cavities and tracts out for three days, then injected bismuth paste, and animal healed up in very short time.

Case No. 3.—Dark bay mare, poll-evil and fistulous withers; was a very bad case. I operated, to be enabled to dry out the tracts to better advantage. Injected paste after five days of the drying-out process and fistula healed nicely, but the poll-evil broke out again. I then mixed the vaselin and bismuth alone and injected tracts daily for five days until it gradually quit discharging; then injected paste on sixth day, and recovery was complete.

Case No. 4.—October 1, 1908. Bay mare (broncho), shot through the ilium and discharging at four inches below the external angle of the ilium. I enlarged opening, and, after curetting sinus thoroughly, I dried it out and left it packed over night; then injected the paste, and animal recovered quickly.

Case No. 5.—October 15, 1908. Black mare, poll-evil had existed about six months in this animal and was discharging a great deal of pus. The first injection failed; then I again used the vaselin and bismuth daily for seven days, and discharge greatly diminished. Made final injection and another complete cure.

Cases Nos. 6, 7, 8, 9, 10.—In one week I injected these five cases without a single failure. No. 6 had existed fourteen months, No. 7 about five years, No. 8 six months, No. 9 about two weeks, and No. 10 one year.

Cases Nos. 11, 12.—Used it on two quitters with success.

Case No. 13.—Gray gelding, fistulous opening in the superior maxillary sinus from bad operation of trephining. Existed one year. I enlarged the opening and discovered that the opening into the nasal fossa was nearly closed, which in a measure accounted for the absence of discharge from the nose. I dried sinus out and filled it up with the paste, and animal made a rapid and complete recovery.

It is needless to describe any more cases, except to say that I have not failed as yet to effect a cure with it, and have treated a great many cases.

Conclusions—1. Fistulous tracts, or abscess cavities, including empyema, can be cured by injection of bismuth paste. 2. Cavities or fistulæ should be as clean and as dry as possible before the injection of bismuth paste. 3. The paste, when injected in liquid state, solidifies in the fistula and serves as a framework for new connective tissue; the paste is absorbed and the fistula obliterated. 4. Bismuth paste injection will not heal out sinuses where sequestra are present; same must be removed before injection. 5. The bismuth paste injections are harmless and produce no dangerous symptoms.

I would be pleased to hear from any of the profession with respect to the success they have with this treatment.

CEREBRO-SPINAL MENINGITIS.

By A. A. LOCKHART, V.S., M.D.V., Carnduff, Sask., Canada.

During the past year I have met with a number of cases of poisoning, I think through the agency of stagnant water or spoiled feed. In one case there seems to be little doubt of the source from which the poisonous material was obtained, but in the others it is not quite so clear.

In terming it poisoning, I doubt if I am exactly correct, as I think that it is more probable the trouble was caused by the entrance into the digestive tract of an organism which found it a very suitable place to proliferate; and, generating a toxine having a special morbid influence upon the medulla. The clinical aspect resembled in some respects a cerebro-spinal meningitis, but I doubt if there was any true inflammation of the meninges of either brain or chord. There was no fever except where complicated with pneumonia; in fact, the temperature was in some cases subnormal.

These are the first cases of this kind I have had and for want of a better term I have called them cerebro-spinal meningitis, and as the cause of this disease in horses seems very indefinite, or, as so many causative factors have been mentioned in connection with it, I think, possibly, several different conditions have been included under this head.

The first symptom to appear in seven out of the eight cases coming under my notice was a complete paralysis of the muscles of deglutition and total inability on the part of the patient to

swallow food or water. In a variable time, in some cases twenty-four hours, in others as much as six or seven days, they would lie down and be unable to even raise the head from the ground. For the most part they would lie there perfectly motionless. Occasionally the neck would become curved and stiffened, mouth opened slightly, while the limbs would thrash violently. I had an idea at first that this might be due to spasm of the cervical muscles; but as there was no evidence of this as long as they were on their feet, I concluded it was just abortive attempts to raise themselves up a little. In two cases there was considerable twitching or quivering of the shoulder and flank muscles some time before they went down.

The pulse in those I saw early in the disease was very little disturbed, but later it became considerably quickened. Its character was full and soft and usually seemed to retain its fullness until within a very short time of death. The temperature also was at first approximately normal, but in several I saw late in the disease it was subnormal, 96-98 degrees Fahrenheit. Feces and urine seemed to be passed normally as long as animal was on its feet. Of course, in cases that had gone some time the abdomen presented a very tucked up appearance.

The first lot of cases I had was about a year ago. When I was called in, one horse had died immediately following an attempt by the owner to administer a bottle of oil; another was plainly suffering from a gangrenous pneumonia and was destroyed at once. Two other horses had been unable to swallow anything, one for about a day, the other for a trifle longer. This last one had already considerable difficulty in rising after lying down, quivering of the muscles when standing, and died the following day. The other one, which presented at that time no apparent symptoms except inability to swallow, did not succumb for five or six days.

The next outbreak was on August 25th last. This time only two cases occurred. The first was a three-year-old colt, and on the 2d of September an aged mare on the same farm took it, and no more have occurred there since. The third and last outbreak was December 15. In this instance two horses were affected; both died within twenty-four hours of each other, after less than forty-eight hours' sickness.

In the first case there seems to be little doubt that drinking water from a long unused well was the prime factor in causing the trouble. The well usually used was beginning to give out, and the farmer, having another well which had not been in use

for a considerable time, thought he would clean it out, so set to work bailing it, emptying the water into a trough that was beside it. While at this the four horses, which had been let out for exercise, came up and took a drink. These were the four which died, the rest of his horses not being affected. The second case was not quite so clear, for, besides having started to use a long disused well, he was feeding some oat chop that had heated. The last case has a more complicated history still. The water used on the farm was from a well which had been used continuously, the feed fresh and apparently sound; and the only suspicious circumstance was that this team had, three days previous to taking ill, been driven over to another farm some miles away and there put in and fed. This farmer has had no trouble of the nature himself though, and apparently all the horses got there was a sheaf of oats out of the stack he was feeding himself.

There are several points which stand out fairly clear to my mind in connection with these cases. First, I think that the fact of the animals in each instance taking sick so closely together and then the trouble ceasing immediately, excludes the idea of its being anything of a contagious nature and points strongly to the theory of poisoning or intoxication from substances taken in through the digestive tract. Also there could be no connection between the different outbreaks, as not only were they separated by a long space of time but also by distance apart, one farm being seven miles southeast of town, one three miles west, and the other seventeen miles north. The first cases being almost without doubt due to some toxic substance contained in the stagnant well, I naturally looked for a similar cause in the next to come under my notice. I found it, but, in addition, the damaged food. The last case presents nothing definite except the fact that if it was at the neighbor's the deleterious matter was obtained it must have been in the food, as they were not watered there. I did not have an opportunity of holding a post-mortem on any of these cases, and doubt very much if I would have gained any information if I had. I must say that I should like to know definitely whether this disease is due to damaged food, stagnant water, neither, or whether it might be caused by both. If any of your readers have any light to give on the subject I should be glad to hear from them. I would also be glad of any suggestions as to treatment, which, on account of the inability of the patient to swallow, presents more than ordinary difficulties.

As all my cases died it will be quite unnecessary for me to go into this phase of the subject.

AN INTERESTING CASE OF OBSTETRICS.

By M. R. STEFFEN, M.D.C., El Paso, Texas.

Patient, pure-bred, aged Holstein cow. General condition good. History: Has had no calf for four years. Is due to calve two days past. Has shown no signs of labor, but has a dirty vaginal discharge and anorexia. Temperature, 106.5° F. Rapid, stertorous breathing, and constantly lies down. The abdomen is tremendously enlarged and the owner expects twins.

Regional examination reveals the os opened to about the size of circumference of one finger. The edges feel hard and refuse to respond even slightly to attempts at dilatation.

With the patient in the standing position a long, probe-pointed bistoury is used freely in the upper median line of the ring. This makes it possible to enter the entire hand, but it does not go far, as the whole neck of the womb is firmly plugged with a tenacious, sticky mucus of about the consistency of soft putty. The moment this is removed the author is grandly soaked by a forcible gush of sanguinolent fluid. This rush of fluid continues as long as the hand keeps the flaccid neck of the womb dilated, and, after the liberation of about twenty gallons, a small, thin, secundine envelope floats out of the right horn. It contains only a small quantity of fluid, no foetus.

The abdomen is now decidedly shrunken and the cow apparently in great distress assumes the recumbent position. Upon again passing the hand into the womb, in this posture, a foetus is felt in the left horn. It is exceedingly large, but dead, and before he can be delivered further cutting has to be done, as the os is yet only large enough to admit a small fist. After considerable mutilating, we accomplish our object. The mother is given a stimulant drench, and no attempt is made to repair the injury to her genital tract. In spite of her old age and only rough after-care, she makes a fine recovery.

A CASE OF TETANUS.

By Dr. L. S. LANE, Plain City, Ohio.

Was called November 11, 1909, to see road mare, property of Mr. D. Found animal suffering with tetanus, idiopathic form. Owner said mare had been ailing several days. I made a careful

examination, but failed to find a scratch or wound. Began at once with tetanus antitoxine, 60 c.c. every six hours, for fourteen days. All the time feeding patient oatmeal gruel three times daily with stomach tube. On the fourteenth day the food fermented in stomach, causing a distressing case of acute indigestion. I was out of town at the time, and when I got to the patient it was about gone. I put her in slings and used stomach tube, removing about two gallons of fermented liquid, which gave instant relief. I make mention of this case to show the large amount of antitoxine used, and the symptoms were still quite marked when we discontinued its use. We also gave one tablet of H.M.C. full strength once daily. The animal made an uneventful recovery.

For Our Dumb Animals

SONG OF THE DEATH-WAGON.

(These verses are dedicated to the common people, who think they have some rights on the streets and highways, and may, if they choose, ride in horse carriages or go on foot.)

I'm the grand juggernaut of this millionaire age;
I snort over the land like a demon in rage:
All the pure air I taint with my poisonous breath,
And I reap, as I run, a rich harvest of death!

When I scorch down the street on my every-day tour,
Beware of my prowess, ye lowly and poor;
For I scorn the vile earth and its vile, plodding kind,
And I leave the sweet scent of my scorning behind.

Then I turn to "good roads" that the ranchers have made,
Leading out far away 'neath the green, rural shade;
Think the ranchers have rights, like their fathers of old
On highways to towns where their products are sold?

When they hear my "honk! honk!" on the public highway,
They just hike to tall timber, and right there they stay
Till I pass in a cloud—my own exquisite breath;
I'm the steed of the proud, the joy-wagon of Death!

Everett, Wash.

R. K. BEECHAM.

CORRESPONDENCE.

Editors AMERICAN VETERINARY REVIEW, New York:

The dawn of the New Year finds the veterinarians of the Pacific Coast with much to accomplish and more to anticipate; for the coming of the A. V. M. A. to the extreme West marks a new era in the history of the veterinary profession west of the Rockies. California is noted for many things, among them being charged with producing the biggest liars and the largest pumpkins; but as we expect many here from Missouri, as well as elsewhere, we are preparing to "show" you, and let you be the judges. Will Davis, in the following lines, voices the sentiment of every true Californian:

"California, you for me
And of you I boast;
There is no place I can see
But the dear old Pacific Coast.
You can have your New York towns,
Broadway may be fine;
But the Golden West
I love the best,
California for mine."

So let the slogan of all be, "On to 'Frisco in September."

Yours for success,

JNO. L. TYLER, D.V.S., M.D.

HORSELESS AGE NOT YET.—The horse is in no more peril of extinction by the automobile than he is of being driven into oblivion by the airship. We are no nearer to the horseless age than we are to the manless age. The two creatures began business in partnership before the dawn of civilization and will continue together at the old stand down to the end of time.—*Horseman and Spirit of the Times.*

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

TUBERCULAR PERICARDITIS IN A DOG [*E. Wallis Hoare, F.R.C.V.S.*].—The history of this six-year-old cocker spaniel is as follows: Loss of appetite since a few days, his abdomen has grown larger lately, he has gradually lost flesh and had an occasional cough. The symptoms observed were: emaciation, anæmic condition, rapid, weak, irregular pulse, accelerated respiration, marked ascitis, temperature 101.5° , dullness on percussion over the cardiac area, heart sounds not audible. Percussion of the chest revealed dullness in the two lower thirds of the thorax, auscultation absence of respiratory murmurs. The right side is normal. Puncture of the abdomen for fluid is negative. After a few days the dog was chloroformed. **AUTOPSY:** Abdominal cavity contained ascitic fluid. Liver congested and enlarged. In thoracic cavity the pericardium is enormously distended and pushing the lungs upwards. There are firm and extensive adhesions of the pericardium, diaphragm and left side of the chest. There was a fairly large effusion in the left side of the chest. The left lung had a cavity containing fluid. Tuberculous bacilli were found in scrapings of this vomica and also from the pleura. Tuberculous lesions were also found with bacilli over the heart and the pericardium.—(*Veter. Rec.*)

TUMOR IN THE UMBILICAL REGION [*By the Same*].—A two-year-old gelding had, when six months of age, a swelling in the umbilical region. This was getting smaller at times and again would grow larger. Umbilical hernia, said the owner. Yet the growth became very hard and as big as a man's fist. The horse was cast and chloroformed. After disinfection, a median incision was made and the tumor dissected out. It extended to the umbilical ring and in its centre contained pus. After its removal the umbilical ring was found not closed. As the peritoneal covering was not injured, during the operation three sutures were passed

through the edges and the ring closed up. The skin was then sutured. The case did well.—(*Ibidem.*)

DEATH OF A MARE BY SNAKE BITE [*Graham Rees Moggs, Lt., A. V. C.*].—Supposed suffering with sun stroke, this seven-year-old mare was laid up because she staggered about in walking, and, in fact, had to be assisted in so doing. Her temperature was normal, respiration 50, pulse irregular, heart beats very abnormal. No signs of pain. She refuses food, but drinks a little water. Stimulants were administered. The next day she appeared weaker. Strychnia was given. The following day she was worse. Pulse is hardly perceptible, respiration much distressed, and the temperature 103° F. Towards evening it rose to 108.5° F., and about midnight the mare died. At post-mortem none of the organs seemed to be diseased, but all the cavities of the heart were entirely filled up with a huge white clot continuous with cordlike coagula extending for many inches into the great blood vessels. These were sent with the heart to the Imperial bacteriologist, who said that "he would suspect the case to be due to either a snake bite or to poisoning. Some agent which was acting on the blood, dissolving the blood cells and forming ANTE-MORTEM CLOTS."—(*Veter. News.*)

BONE OBSTRUCTIONS OF THE RECTUM IN DOGS [*J. Kirby Pilkington, M. R. C. V. S.*].—These cases occurred in a two-year-old Pomeranian dog and a six or more years half-bred mastiff. The symptoms were very similar in both. Off food, great pain, very uneasy, constant straining, arching of the back, howling, etc., etc. In the mastiff there was abundant salivation, chopping and twitching of the jaws. By rectal examination the cause of the trouble was made out. Free enemas brought about the result. In the Pomeranian there was a bone one and one-half inch by half an inch, sharp at both ends. In the mastiff a piece of acetabulum of a sheep's pelvis with strong spicules and measuring two and one-half inches by one and one-quarter.—(*Ibidem.*)

VENTRAL HERNIA—OPERATION—DEATH [*Wallis Hoare, F. R. C. V. S.*].—Aged harness horse was found impaled on a gate and removed with great difficulty. The next morning there was a dependent swelling on the inferior aspect of the left flank, extending almost to the stifle. There was one also further forwards, extending close to the margin of the false ribs. Much effusion existed and the parts were very painful, the skin show-

ing evidence of considerable bruising. Puncture with a fine trocar gave no information as to the nature of the contents of the swellings. The horse was cast and chloroformed and a hernia recognized through an extensive rent of the abdominal muscles. On account of the condition of the parts it was thought better to postpone any immediate interference. Four days after the swelling hung beneath the level of the stifle, the skin was excoriated, serum escaped through the puncture made with the trocar, the presence of a large amount of intestine in the swelling was made out. The following day the horse exhibited symptoms of colic, quite severe, with quick, weak pulse and a temperature up to 102° F. Chloral was administered and gave relief. However, it was clear that immediate operation was indicated. The horse was cast, chloroformed, properly secured, and the site made as aseptic as possible. An incision made over the posterior part of the swelling opened into a cavity containing a loop of small intestine and a large amount of torn and bruised omentum. After enlarging the opening of the abdominal muscles with a probe-pointed bistoury the entire mass of escaped intestines was finally replaced and the injured omentum removed with scissors. The layers of peritoneum and abdominal walls were sutured, not without troublesome hemorrhage, and the skin wound was closed after packing the cavity with cyanide gauze. The animal got up when the effects of chloroform had passed away and he did well for ten consecutive days, when he had two attacks of colic and succumbed to the last. AUTOPSY: No tympanitis, abdominal wound perfectly healthy and complete union. Extensive adhesions of the small intestines with abdominal wound, causing constriction of the intestines, which is congested and œdematous. Adhesions existed also between coils of the intestines, which were dark in color externally but presented no evidence of strangulation. There was no evidence of diffuse peritonitis.—(*Veter. Record.*)

RENAL CALCULUS WITH COMPLICATIONS [*Arthur Payne, F. R. C. V. S.*].—Male St. Bernard dog, healthy until ten months old, is then a little out of condition, from which he is brought out by good feeding, arsenic, iron and quinine. Nearly two years after he has great difficulty in passing blood-stained urine. His kennel is sprinkled with it. A cast two inches long is found. No calculus could be found in the urethra or bladder. The temperature is 102.3° F. Pulse quick and small. Urotropine is pre-

scribed, with diet of milk, fish and boiled tripe. Great improvement is noticed and lasted for one week, when the same symptoms returned; passing a metal sound in the urethra, a calculus is felt in the usual position in the urethra. By direction of the owner the dog was killed. At the post-mortem a calculus was found in the urethra just behind the os penis. The walls of the bladder were thickened and the mucous membrane was eroded and inflamed. There were nine calculi in the bladder. In the pelvis of the left kidney there was also a calculus formed of three pieces which, when put together, formed a stone five centimeters in length and three in thickness.—(*Veter. Journ.*)

A FEW CASES OF SINUSES OR BLIND FISTULÆ [*Prof. J. J. O'Connor*].—Under this heading the author records, first, two cases of poll-evil and two of fistulous withers which were rather complicated and demanded severe surgical interference in the shape of free incisions, counter openings, removal of necrotic structures, curetting of bones, sections of ligamentum nuchæ and subsequent treatment with antiseptic washings, irrigating with iodine, boric and powder manganate of potash, with, at times, a little perchloride of mercury. One of the cases of poll-evil took nearly six months to get well. Of the fistulous withers, one demanded four months before he could return to work; the other one had to be destroyed, as the suppuration extended under the scapula and his recovery was too doubtful.

Another case of sinus in the shoulder is also recorded where it was necessary to remove a piece of the spine of the scapula on two occasions.

A retriever is also the subject of another interesting case. Injured by a golf ball in front of the left knee, the dog was submitted to severe operation for a very large and painful swelling involving the upper part of the carpus and the lower part of the radius and ulna. An incision exposed a comminutive fracture with loose particles of bone, which were removed. The parts were curetted and dressed antiseptically. At first all seemed to progress satisfactorily, but then again abscess formed, and abundant discharge occurred from a fistulous tract. It increased in quantity, became very offensive, and amputation just below the elbow had to be performed. It was followed by recovery. Septic periostitis had been the cause of the relapse. The record closes with two cases of a sinus in a horse's foot. A mare had become lame and the cause not discovered until a few days after. It

was a piece of a lady's hatpin which then protruded behind the point of the frog. Although it was withdrawn the mare grew worse; she had a deep sinus which was enlarged, exposing diseased plantar aponeurosis and superficially affected navicular bone. Antiseptic dressing of lysol, tincture of iodine, sterilized gauze, etc., brought out a complete recovery in six weeks.—(*Veter. Journ.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

EFFECTS OF THE LICKINGS OF DOGS ON THE CICATRIZATION OF WOUNDS [*The Late Prof. Suffran*].—A two-year-old dog has had an abscess on the left side of the chest which has left a wound irregularly round with skin surrounding undermined; there are sloughings here and there of parts of muscles. The intercostals are almost entirely destroyed by the necrotic action of the pus. The general condition is bad, the dog eats nothing and is *constantly licking his wound*. His coat looks dull and staring, the muscular system is much emaciated and the visible mucous membranes pale. The wound was attended to first. Complete disinfection, removal of necrotic tissue, dressings with boiled water, peroxide of hydrogen, boric acid and dermatol, protective bandage round the body. Injections of physiological serum were administered. After a few days the wound assumed a better aspect, and, with change, the general condition of the dog is also improving, he eats good, puts on flesh and is sent home convalescent.

After a few days he is returned with evident symptoms of gastro-enteritis. The bandage had been taken off before complete cicatrization and the dog has returned to its bad habits; he has licked the sore again and again, and this has resumed its bad character as before. Besides this, the dog has articular pains; he is in constant suffering. The original treatment of the wound is resumed, and, to overcome the general bad condition, injections of caffeined serum is prescribed. This treatment will be followed this time until radical cicatrization of the wound of the chest. Under its influence improvement is soon manifested again and recovery obtained in a short time.

Conclusions—Covered dressings can never be recommended too much in the treatment of wounds in animals that can lick themselves.—(*Rev. Veter.*)

A SCLEROSTOMA IN A CYSTIC TESTICLE OF A CRYPTOID [*By the Same*].—Pure Anglo-Arab thoroughbred had left abdominal cryptorchidy for which he was operated. The operation was successful and followed by recovery, although it was quite difficult, on account of the specific lesions of the testicle and of its enormous dimensions. When it was removed it appeared as a mass as big as a child's head, soft, and fluctuating all over its surface with a large cyst. This consisted of a single pouch, with, however, three or four diverticuli. It contained 300 cubic centimeters of serum, limpid, transparent, yellow citrine in color and strongly albuminous. On the portion which separated it from what remained of the testicular gland there was observed a little orifice from which protruded a white filiform body, regularly cylindrical, which, being carefully pulled out, proved to be a sclerostoma armatum. The histology of the testicle showed that there was no glandular tissue left and that the organ was only constituted of connective fibrous tissue.—(*Ibidem.*)

A CASE OF MILIARY CARCINOSIS IN A DOG [*Same Author*].—Aged fourteen years, this white French poodle has never been sick, but since a fortnight he is very weak, constantly lays down, and has severe dyspnoea with the slightest effort or exertion. He is in poor condition, indeed, and much emaciated. His abdomen is enormous, but there is no peritoneal dropsy. Laid on his back, by exploring the abdomen, two large and hard tumors are detected. The smallest is round and as big as the fist. It is situated in the left side of the abdomen and is easily displaced with the intestinal mass. The other, much the larger, as big as a child's head, is located in the right hypochondriac region. The liver feels hypertrophied, hard, bosselated, but not painful. There is no doubt that the case is one of multiple abdominal tumors; certainly, in the liver and mesenteric glands, or spleen! a case of cancerous cachexia beyond treatment. The dog died the next day.

Post-mortem—In opening the abdominal cavity there were exposed enormous quantities of neoplastic masses in the liver, the spleen, the pancreas, intestines, lymphatic glands and peritoneum. The size of these tumors varied from small, disseminated masses, as big as a pin's head to that of a child's head.

The spleen formed a mass weighing 925 grammes. Some of the tumors are soft and cystic. In the peritoneum 50 cubic centimeters of ascitic, reddish, bloody fluid was extracted. The kidneys and the bladder were the only organs of the abdomen that were free from lesions. In the thoracic cavity, while there were some, they are less developed and generally on the mediastinum, the pleura and the lungs. The bronchial and mediastine glands presented some also. Histologically these tumors proved to be lympho-sarcomatous in nature.—(*Rev. Veter.*)

A CASE OF HYDROCEPHALY IN A DOG [*Mr. Oulès*].—A Danish hound pup of three months has a stupid physiognomy. No expression of features, dull look, general depression of all the senses, he ignores all that takes place round him. His cranium is abnormally developed, his face is short and aborted. Five or six centimeters above the right orbit there is a fontanel. Standing, the dog when left alone, moves in a circle, always to the right, sometimes in a circle, or again rotating on his haunches when sitting down. Placed in his kennel, he lays in the sterno-abdominal position. He has great difficulty in getting up and at times cannot do it. He does not answer to a call, does not recognize his master, cannot find his own kennel, and attempts to run away when one tries to take hold of him. Yet all the functions of vegetative life are normal. He eats good; he even enters into erection. Placed on observation, no change occurs, and he is destroyed. The lesions were located in the cranial cavity and beyond a large cystic tumor occupying the cavity, the principal lesions consisted in: 1. The almost total absence of some of the ventricular organs, the corpus callosum, cerebral trigone, and the complete disappearance of the septum lucidum. 2. In the absence of the white substance and of the horns of Ammon. 3. In the atrophy of the ganglia of the base on the right side.—(*Revue Veterin.*)

PARALYSIS OF THE PENIS—AMPUTATION [*Dr. Fontaine, Army Veterinarian*].—Sequela of an infectious disease, this paralysis has existed for several months and amputation becomes necessary, which is performed with the classical method. Injection of cocaine, circular incision over the corpus cavernosum, extended by a V incision on the inferior part of the penis, dissection of the urethra distended with a catheter, section and suture of the canal, elastic ligature on the cavernosum, excision two centimeters below the ligature. Late in the evening an abun-

dant hemorrhage takes place, the elastic has slipped and got loose. It had to be replaced by another made of strong cord. The loss of blood has been quite abundant, as when the animal is allowed to rise from the bed where he was operated, he staggered and two litres of caffeined serum had to be given to him. The animal did well after this, but, notwithstanding the care taken in the operation, the penis retracted considerably and the stump was drawn within the sheath. The slough of the end of the penis which had been strangulated with the cord ligature was quite slow in taking place. The author recommends that the amputation always be made in such a way as to guard against the retraction of the penis and also prefers the use of strong cord rather than the elastic ligature to control the hemorrhage.—(*Rev. Gener. de Med. Veter.*)

FRACTURE OF THE RIGHT BRANCH OF THE INFERIOR MAXILLARY—METALLIC SUTURE [*Same Author*].—On the border of the right branch of the lower maxillary a six-year-old mare has a running sore in the centre of a diffuse swelling, probably the result of a kick. A probe introduced comes in contact with the bone, which feels rough. Examination is painful; there is abnormal mobility and crepitation is heard. The case is one of open fracture without much displacement. A free, crucial incision is made, the bone exposed and curettage of the superficial splinters. The fracture is seen running from the anterior border of the first molar obliquely downwards and backwards. It is complete and the fragments of bone are separated by an organizing clot. A hole is made through the fragments of the bone on each side of the fracture and a piece of galvanized iron wire passed through both and its ends are twisted on the outer surface. After cleaning and oxygenated water applications the skin wound was closed, leaving the centre open, and the whole was protected with gauze and collodion. Soft diet is prescribed. After two weeks the metallic sutures became loose and were removed. The consolidation was quite sufficient to allow a more substantial feeding; mash, carrots and crushed oats were allowed. Complete recovery after a month.—(*Revue Gener. de Med. Veter.*)

CONTRIBUTION TO THE STUDY OF STRINGHALT CAUSED BY ADHESIONS AND SHORTENING OF THE TENDON OF THE LATERAL EXTENSOR OF THE PHALANX [*Mr. Mammale, Army Veterinarian*].—Instead of performing the ordinary subcutaneous ten-

otomy of that tendon, the author performs the tenectomy as follows: The region well shaved and disinfected, a three centimeters incision is made on the skin; after isolating the tendon from the subcutaneous tissue it is raised with a directory and a disinfected cord is passed underneath and secured on the tendon with a running knot, so that, by strong tractions upon the tendon, the adhesions that may have been contracted as the tendon passes on the groove over the external face of the hock are lacerated. When these tractions have been sufficient, and the tendon is loose, a piece of it is cut off, measuring three centimeters in length. Disinfection, suture and iodoformed collodion dressing. When the animal is up from the bed of operation, he is made to walk for ten or fifteen minutes. Then, every day after, he is made to take light exercise, walking or even trotting for half an hour. Complications are very rare, and complete recovery in eight or ten days follows. Out of twelve cases thus operated the author has obtained seven perfect recoveries, three improvements, and met with only two failures.—(*R. G. de M. V. and Rec. Hyg. et Med. Vet. Nilit.*)

ITALIAN REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

ENZOOTY OF BOTRIOMYCOSIS OF CASTRATION IN SWINE [*Dr. Fracaro Ruggero*].—Five young swine, two males and three females, two months old, were castrated. Some twenty days after the operation each had either in the scrotal region or the left flank, according to the sex, a swelling. Those of the scrotum were not hot nor painful but hard, oval in shape, as big as the fist of a man, and rather movable. In exploring deeper in the inguinal canal another swelling could be felt, soft and fluctuating, which was thought to be due to hernia of the omentum or of the intestines. The swellings of the females in the left flank was projecting some; but slightly under the skin it was smaller and had a tendency to extend towards the lower part of the abdomen. In all of the five animals the central point of the tumor was the seat of a cutaneous ulceration, seat of the operation of castration, from which there escaped pale, yellow pus having a bad odor. A probe introduced in the wound went in quite deep and gave the sensation of a rough and anfractuous fistulous tract. Infection after operation and funiculitis of botriomycotic origin was

diagnosed and an operation for the removal was performed. The growths were removed: with the males by dissection and amputation of the cord, which was much enlarged; with the females by isolating the tumor with dissection and closing the wounds of the peritoneum, muscles and skin. Examination under the microscope of sections of the tumors revealed the presence of botriomyces.—(*La Clin. Veterin.*)

CARIES OF THE PHALANX IN A DEER—COMPLICATIONS—RECOVERY [*Prof. Felice Cinotti*].—A twelve-months-old deer was brought to the author. She was lame. Raised and kept in a large private country place, she was in splendid condition and quite tame. One morning she showed soreness in the internal claw of the right fore foot. Treated by the owner, she did not improve. She had a large sore on the plantar surface of the foot, and probing run down the third phalanx. Simple appropriate treatment was applied for a few days and accompanied with improvement to such an extent that the beast was returned to her field. After a while, however, the lameness again returned, as the leg had become swollen and quite sore. She had arthritis of the articulation of the two last pasterns. Amputation at the second interphalangeal joint had to be performed. From this, the animal did well for three months, but once again she had another relapse; the leg up to the knee seemed affected. - It was swollen, measured 21-23 centimeters round, and looked like a case of elephantiasis. Was it an actinomycotic or a blastomycetic osteo-periostitis? Disarticulation at the radio-carpal joint was performed, anesthesia being obtained with an injection of stovaine at 2 per cent. The operation was a perfect success. The stump of the leg was protected with a little box secured round the forearm and soon the little animal educated itself to walk on three legs. She was several months after found dead in the field with throat torn by a mastiff dog.—(*Il Nuovo Ercol.*)

AUTO-AMPUTATION OF THE TONGUE IN A COW [*Dr. F. Cinotti*].—A fine milch cow, five years of age, had been delivered some days previous of two dead calves. The labor was long and difficult, and during its execution the cow made violent efforts and exhibited much pain; to such an extent that, said the cow-keeper, he had never seen the like, although he had been engaged in that kind of work for many years, and had seen many cows deliver. Indeed, said he, "the animal rolled her eyes and ground

her teeth in a terrible manner." The cow was fat and in good condition, but a few days after delivery she refused food and drank but little. Drenched with farinaceous beverages, she did not improve. And at last, as the tongue was noticed hanging as dead out of the mouth, the owner called for veterinary assistance. From the nostrils there escaped some mucus, normal in aspect, but that the animal did not leak out as is usually done by those animals. In depressing the lower lip, the tongue was observed with a deep fissure, oblique from left to right, with the part in front of a greenish yellow color, cold, mortified, throwing out a very offensive odor of gangrene and ready to slough out. The mortified part was twisted off without great difficulty nor hemorrhage and left a granulating healthy stump. The mortified part measured eighteen centimeters in length. It weighed thirty-six grammes. It was in a state of gangrene. It was supposed that during the accesses of pain accompanying the act of parturition a portion of the tongue had been squeezed between the molars and subsequently mortified.—(*Il Nuovo Ercol.*)

SARCOMA OF THE MAMMÆ WITH INFILTRATION OF CELLS CONTAINING PIGMENTARY ELEMENTS [*Prof. Garibaldo Lisi*].—A slut, aged eight years, presented on the left side of the pectoral region a bosselated, hard tumor about fourteen centimeters in diameter. This was adherent by a wide basis to the tissues underneath and had, since two months, grown between the first and second pectoral mammæ. Between the first and second right abdominal and the first left abdominal there were several smaller ones about the size of a hazel nut. The lymphatic vessels starting from the base of the tumor were large and ran in various directions on the chest and over the abdomen. The tumors were removed and formed a mass which weighed 470 grammes. The central portion of the large one was composed of a mass of necrotic substance having an offensive odor. The minute examination revealed them to be of a sarcomatous nature, with here and there deposits of pigmentary cells and also of tissue of cartilaginous nature.—(*Il Nuovo Ercol.*)

FOREIGN BODY IN THE LUNGS OF A HEIFER [*Same Author*].—This was a surprise of post-mortem. The animal had been slaughtered, although in good condition of nutrition, but because she had a constant cough. At the autopsy a piece of wire was found lodged in the supero-anterior part of the right pos-

terior lobe of the lungs. It measured about ten centimeters in length and occupied a slightly inclined position from forward backward parallel to the median plane of the body of the animal. The foreign body was in three-quarters of its length surrounded with a large layer of connective tissue which posteriorly ended into a cul-de-sac. The lungs were free from lesions and no adherences with the diaphragm existed. It was evident that the foreign body had reached the lungs by way of the larynx and trachea and not by the digestive tract.—(*Ibidem.*)

THORACIC CYST COMMUNICATING WITH THE ABDOMEN [*Same Author*].—In inspecting meat at a slaughterhouse, the author observed in an eighteen-month-old calf a kind of transparent sac filled with very clear and very thin fluid. The sac was spindle in shape, seventy-five centimeters long and four wide. Attached to the inferior and median plane of the anterior face of the diaphragm, it hung in the thorax about on a level with the xyphoid cartilage. It was attached by a strong peduncle, quite short, and which was in communication with the abdominal cavity, being supported on the posterior face of the diaphragm by a kind of ring continued with the serous membrane. The thickness of this cyst was not the same in its whole extent. The external coat was formed with the serous covering of the anterior face of the diaphragm muscle and the internal by that of the posterior, the middle coat was of connective tissue mixed with elastic fibres. This lesion was evidently congenital.—(*Ibidem.*)

STRANGER (in Drearyhurst): "Is there any place in this town where I can get something to drink?" Uncle Welby Gosh: "Yes, sir, onless you're mighty blamed hard to please. There's four town pumps, a sulphur well, an' half a dozen places where you kin git root beer."—*Chicago Tribune*.

A LARGE barn on the Patchen Wilkes Stock Farm at Lexington, Ky., owned by Mr. W. E. D. Stokes, of New York, was destroyed by fire recently and twenty-nine valuable trotting bred brood mares were burned to death. Among the mares burned were many noted animals sent here from all parts of the country to be bred to Peter the Great, 2.07½. The loss is estimated at \$50,000. The fire started from an explosion of natural gas.—*Rider and Driver*.

SOCIETY MEETINGS.

TWENTY-SEVENTH ANNUAL MEETING OF THE ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION.

The twenty-seventh annual meeting of this association was held at the Lexington Hotel, December 1st and 2d. President N. I. Stringer in the chair and seventy-five veterinarians present.

The minutes of the semi-annual meeting, held at Bloomington, July 13, 1909, were read and approved.

PRESIDENT STRINGER'S ADDRESS.

Gentlemen—We are now at the beginning of the twenty-seventh annual session of the Illinois State Veterinary Medical Association, to which I extend to this large number of veterinarians a most cordial welcome.

I stand before you as the trentieth president of this association (some presidents having served more than one term), and I assure you that I cannot express to you in words the gratitude I feel toward you for the honor you have conferred upon me.

I have received honorable recognition by you for the past three years—two years as secretary and one year as president.

I have spent a great deal of time and energy in my feeble way to further the welfare of this association. I have felt all along the way that you could have chosen others more competent, and better results obtained.

At the close of this meeting I will step back in the ranks where I am sure I shall feel more at ease and in my proper place.

The president is expected to deliver an address at the annual meeting, which has been adhered to with few exceptions. I feel that I would like to be one of the exceptions. My remarks will be very brief for I do not want to take up the valuable time that should be given to the program.

After our secretary had been campaigning for some time for papers and was not receiving replies to his requests, he wrote somewhat discouragingly to me. By a united effort we have been able to secure and present to you the largest and best pro-

gram that has ever come before this association. Every subject is a good one and every essayist is competent to handle his subject thoroughly. Right here I wish to inform each essayist that they have the heartiest thanks of our secretary and myself for their kindness.

At this point please pardon me for reiterating what has been said by former presidents, and that is, please respond to the secretary's invitation to furnish a number for the program whether or not you will furnish a paper. You should consider it an honor to be asked to read a paper before this—one of the best associations on this continent. By refusing to reply to the secretary's request, it makes him feel that you consider it an insult to be asked for such a favor. If the members were more responsive it would be an easy matter to have a two days' session at our semi-annual meeting; and a few clinics ought to be added also. A few years ago it was an easy matter to get up a program. It only required one main subject and two minor ones, namely, azoturia, parturient apoplexy, and tetanus.

After the discussion upon azoturia had been started it was almost impossible to get it stopped. How different now! If at this moment I should announce to you that I am going to read a paper on azoturia, every one of you would look at me with a quizzical eye, and say to yourselves: "I wonder if he thinks that he is going to tell us anything that we don't know." Parturient paresis has been practically conquered.

I prophesy that judging from the ground that we are gaining on tetanus, that the time is not far distant when it too will meet its annihilator. But for azoturia I have no prophesy to make. It is hoped that our scientific men will not stop their search until they can explain the true pathology of the disease, cause, and successful treatment.

In my paper upon hypodermic and intravenous medication at Bloomington three years ago, I prophesied that it would eventually be the only true method of treating disease. I am realizing that my dream is coming true. Alkaloidal medication is taking the place of bulky drugs.

The knowledge of phagocytosis and the opsonic theory (which you will hear about during this meeting) is fast conquering germ diseases by the hypodermic application of serums, bacterius and autogenic treatment.

We wish that the young graduates would respond more liberally when asked to write papers for the meetings. Possibly

some of them fear their paper will not be interesting, or that their paper will be criticized by the older veterinarians.

Young man, do not fear criticism, for you will get used to that when you have been in practice a few years. Remember that any subject is always interesting to the older members, and they are ever ready to enlighten you whenever they can. The majority of your audience are usually young graduates like yourself. The old members who commenced to write papers as soon as they joined the association, are the ones who have received the greatest benefit, especially those who have continued to be active workers. With the increased time required by our veterinary colleges and the addition of several scientific chairs, our new graduates should be competent to present an interesting paper at any time when called upon to do so.

Pardon me for making the severe application when I say that we have too many veterinarians of the porcine type who absorb everything they can from others, but are very careful not to impart any of *their* knowledge. Some will use what they gain from you as a knife to stab you in the back with. Others stay at home during the meetings of the association for fear they will lose a few dollars in their practice, or in the hope that they may get a few clients away from their near competitors; they are of no use to the profession, but they are quick to squeal and want the law applied by some one else should any quack get to doing business in their neighborhood.

The past year has been exceptionally good for practice. This is due to the high prices of stock and to the desire of the stock raisers to have their animals treated by qualified men.

We should be grateful for the fact that never before in the history of this state has there been a State Board of Live Stock Commissioners and State Veterinarians that has done so much for the stock raising interests and the veterinary profession.

In conclusion let me call your attention to the great feat performed by the Chicago end of this association, who are also embodied in the Chicago Veterinary Society, in the grand entertainment they gave to the largest and best meeting ever held by the American Veterinary Medical Association. Every detail was carefully planned, and every detail carefully carried out. The burden must have been a heavy one, and this association owes a debt of gratitude to its Chicago members. Never before in the history of the A. V. M. A. was the list of new members

so large, and I hope that it will be a stimulus to increase the membership of our state association two fold.

Following the president's address, the Board of Censors not being present, Drs. C. C. Mills, J. M. Kaylor and R. W. Storey were appointed as censors, pro tem.

The names of Drs. D. F. Stevens, Mt. Morris; J. P. Doran, Ohio, Ill.; J. A. Ragan, Morris; C. E. Harvey, Evanston; Albert T. Peters, Springfield; O. E. Dyson, Chicago; H. R. Ryder, Chicago, and C. G. Dienis, Ottawa, were presented and approved by the Board of Censors. On motion the secretary was instructed to cast the ballot of the association, and they were declared duly elected to membership.

READING OF PAPERS.

"Fistula; Causes, Operation, Treatment," by Dr. W. G. Hassel, Grayville—The doctor advocated opening the tract to the bottom, and packing it with linseed oil and turpentine, equal parts; and claims excellent results.

Discussion—Drs. Mills, Glendenning, Welch, Chamberlain, G. B. Jones and Nesbit.

"Laporotomy in a Dog," by Dr. B. F. Hudson, Moweaqua—This was a very interesting report of the successful removal from the intestine of two small bones, a ball of hair, and a ball of some unknown substance. The dog made a good recovery and worked in the field the following season; one year later the animal died from what the doctor believed to be a stricture of the bowel, but no post mortem was held.

Discussion—Glendenning, Mills, Crawford and Blair.

Adjourned for lunch to meet at 1.30 p. m.; the meeting was again called to order and the reading of papers continued.

"Johnes' Disease in Cattle," by Dr. H. R. Schwarze, Chicago—A very interesting paper, which was discussed, and specimens were passed around.

Discussion—Drs. Joseph Hughes, Hassel, and M. H. Reynolds, Minn.

Dr. Hughes stated that according to a late report from Prof. Bang these cases would react to an injection of avian tuberculin.

"Neglected Opportunities," by Dr. O. E. Dyson, Chicago—This paper was a plea to veterinarians to better inform themselves along the lines of breeding and feeding of live stock.

"Our State Biological Laboratory" was responded to by Dr. A. F. Peters, the director in charge; he gave a short explanation of the production of hog cholera serum, and advocated

exhibits at farmers' institutes and county fairs of pathological specimens, with the object of informing the public on such matters.

"Infectious Anemia in the Horse," a report by Dr. A. H. Baker, Chicago—This was a typical case of that fatal disease and was listened to with a great deal of interest, as it occurred in this state.

Discussion—Drs. Mills, Martin, Hassell, Welch and N. S. Mayo, of Virginia.

Report of Cases, by Dr. W. J. Martin—The first was a case of "Open Joint," with healing in twenty days. The next was a case of "Choke," with the subsequent lodgment of the butt of a whip in the esophagus, abscess, etc., and recovery. The next was a case of a colt being injured by a harrow, with the result that the nictatan membrane was exposed, also the teeth, and severe lameness; and recovery.

Discussion—Drs. Welch, Hassell, G. B. Jones, Mills and Hymes.

"Impaction of the Rumen in the Ox," by Dr. J. C. Wingert, Marengo—A very able paper and dealt with disease in the flatulent and dry forms, and advocated the use of the stomach tube to soften the contents of the stomach, also to give medicine through.

Discussion—Drs. G. B. Jones, Nesbit, Joseph Hughes, Hensel, Wise, Wray and Martin.

Adjourned to meet at 8.30 in the banquet room.

Promptly at the appointed hour sixty-three veterinarians sat down to a sumptuous banquet provided by the management of the hotel; all enjoyed it; cigars were passed, after which the company listened to an intellectual feast provided by the speakers of the evening.

Dr. M. H. Reynolds spoke for "Minnesota," and in a few brief remarks outlined what Minnesota had accomplished in the past and what they hoped to do in the future.

P. S. Haner, Chairman of the State Board of Live Stock Commissioners, responded for "Illinois," in a few pertinent remarks, and extended a cordial invitation to the association to hold their next semi-annual meeting at the State Biological Laboratory.

Dr. Maxmillian Herzog (M.D.), spoke on the progress of pathology, the strides it had made in recent years and its future prospects.

Dr. D. M. Campbell, editor of the *Missouri Valley Bulletin*, spoke for his state, and advocated veterinarians should subscribe for current veterinary literature and thus keep themselves informed.

Dr. A. T. Peters, the new acquisition of Illinois, in his own modest way expressed his sincere hopes that the new Biological Laboratory would be a help to the veterinary profession of Illinois, as well as to the live stock interests.

Dr. N. S. Mayo, late Chief Veterinarian of Cuba, responded for the "Sunny South," and all could feel the warm breezes as they swept across the room, and for the moment we could see the palm trees wave and could imagine ourselves in that fertile land across the sea.

Dr. Jas. M. Wright, State Veterinarian of Illinois, in his own forceful way, spoke of the relation of the veterinary profession and politics, and contended that only through political recognition could we hope to get legislation that would be beneficial to the veterinarian, and also protect the public health.

T. J. Russell, the new member of the State Board of Live Stock Commissioners, was called upon to say a few words, and responded in a way that convinced every one present that he would do all that was possible to conserve the live stock interests, and expressed his appreciation of the veterinarian as a sanitarian.

Dr. D. Arthur Hughes in a few words voiced his appreciation of the association and the work it was doing.

At 11.30 p. m. the company broke up to meet next morning at 10.

At 9, Dr. Knisely, the inventor of the double stomach tube, gave a demonstration of his tube; it was witnessed by a goodly number who were much interested.

Promptly at 10, December 1st, the meeting was called to order and the reading of papers proceeded with.

"Experience With Parturient Paresis," by Dr. W. G. Neilson, Monmouth—A very interesting paper which brought out a liberal discussion.

"Severing of the Extensor Tendon," by Dr. C. C. Burns, Bement—A rather remarkable case of healing after an accident of this kind.

Discussion—G. B. Jones, Mills and Wilson.

"The Duty We Owe to Ourselves," by Dr. H. A. Presler, Fairbury—This paper advocated that veterinarians be more ethical, and so command the best prices for their services.

Discussion—Drs. A. H. Baker, Hymes, Mills, Alverson, Glendenning and Nattress.

"Phagocytosis and Opsonins," by Dr. Maxmillian Herzog—The doctor spoke extemporaneously and gave a very lucid explanation of the latest discoveries along those lines. The subject proved to be a very interesting one; the doctor lauded the application of opsonins in the cure of chronic infections.

Discussion—D. M. Campbell, Joseph Hughes.

Adjourned for lunch to 1.30 p. m.

At 2 p. m. meeting was called to order, and the reading of papers resumed.

"The Stallion Law and the Veterinarian's Certificate," by Dr. L. A. Merillat—This consisted of an explanation of the operation of the stallion law that becomes effective January 1, 1910, and requires that all stallions that stand for public service be registered.

"Production of Milk," by Dr. Matthew Wilson, Waukegan—A very comprehensive paper dealing with the milk question, sanitary conditions, and the attitude of stock owners to the tuberculin test.

Discussion—Dr. Blair.

"Surgery and the Country Practitioner," by Dr. C. G. Glendenning, Clinton—This paper made a plea for more aseptic precautions amongst the country practitioners, discouraged barn yard operating, and advised the use of anaesthetics.

"Draught Horse Breeding in this Country," by Mr. E. T. Robbins, B.S., M.S.A.—This was a masterly plea for the breeding of better classes of live stock, and the building up of that industry.

On motion the secretary was instructed to see that the paper be published.

"Treatment of Contracted Tendons in Young Colts," by Dr. James Smellie, Eureka.

Discussion—Dr. Welch.

NEW BUSINESS.

On motion Drs. Martin, Burt and Smellie were appointed to draft resolutions thanking the Chicago Veterinary Society for the able manner they entertained the A. V. M. A. during the meeting in September.

The resolution was adopted and the secretary instructed to have a copy engrossed and sent to the society, also that the resolution be spread on the minutes of the association.

ELECTION OF OFFICERS.

The following officers were elected by unanimous ballot: President, Dr. C. G. Glendenning, Clinton; Vice-President, Dr. James Smellie, Clinton; Secretary, Dr. J. H. Crawford, Harvard; Treasurer, Dr. G. Walker, Chicago. Board of Censors, Dr. A. Worms, Chicago; Dr. J. T. Nattress, Delavan; Dr. N. P. Whitmore, Gardner.

On motion a committee on necrology was appointed to draft suitable resolutions on the death of the late Dr. Leonard Pearson.

It was moved and seconded that the association accept the invitation of the State Board of Live Stock Commissioners to hold the next semi-annual meeting at the State Biological Laboratory. Motion carried.

On motion the rules were suspended and the following gentlemen were duly elected: A. C. Ammann, Maroa; F. A. Shepherd, Fairmount; J. C. Cowser, Farmington; M. J. O'Donnell, Chicago.

Drs. A. H. Baker, Presler, and Welch, were appointed as auditing committee. The report of the auditing committee was read and on motion the report was accepted.

President C. G. Glendenning was then conducted to the chair and in a few well chosen words thanked the association for the honor conferred and assured the association that he would try to merit their confidence and approbation. On motion the meeting adjourned at the call of the President. It was conceded by all that it was the most successful meeting in the history of the association. The register shows that 164 attended the meeting.

J. H. CRAWFORD, Secretary.

SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION.

The seventeenth semi-annual meeting was held in the Board of Trade Rooms, Reading, Pa., December 15, 1909, beginning promptly at one p. m., with Dr. D. R. Kohler in the chair, and Dr. W. G. Huyett in his place as secretary. No morning session

was held owing to the unavoidable absence of Pres. Newhard, and the members present being less than a quorum.

The reading of the minutes of the previous meeting and roll call was dispensed with upon a motion.

The name of Dr. S. F. Griesemer, Bernville, was presented for membership and approved by the Board of Trustees. On motion the secretary was instructed to read the ballot of the association for him, and he was declared duly elected to membership.

Under new business Dr. Noack presented the following resolutions:

Whereas, It is important for the state that all contagious and infectious diseases amongst live stock be suppressed; and,

Whereas, It frequently occurs that animals die from a contagious or infectious disease and are buried without the cause of death being known; and,

Whereas, It is in the interest of the state to support the live stock owner and breeder; therefore, be it,

Resolved, By this association, in regular meeting assembled, that an act shall be introduced at the next legislative session, that the live stock owner shall be reimbursed by the state for the loss of animals which are proved to have succumbed to such disease by the autopsy held on such animals and the minute report of such autopsy made in writing by a qualified veterinarian.

A motion was made and seconded that the President appoint a legislative committee of three to present these resolutions before the next legislative session.

READING AND DISCUSSION OF PAPERS.

Dr. O. G. Noack presented a valuable paper upon the subject of the "Importance of Municipal Control of the Sale of Meat and Milk." The paper was discussed by Drs. Kohler, Huyett and Fetherolf.

Dr. Kohler remarked that the local butchers of his section often buy cattle under conditions with the farmer that said animal must "kill right;" that is, free from any infectious disease, or the loss would fall back to the owner.

The next essayist, Dr. W. S. Longacre, being unavoidably absent and also having failed to present his paper to the secretary, Dr. W. G. Weber was called upon by the chair on "Reports of Interesting Cases."

a. "TETANUS IN A MULE."

Dr. Wehr claims he gets excellent results with the anti-toxin treatment and highly advocates it; he recently had seven recoveries out of fourteen cases.

It was the consensus of opinion that tetanus anti-toxin is a positive and reliable preventive and should be used more frequently in wounds upon valuable horses especially; but as a curative it is not so highly recommended because the drug is often of inferior strength, not properly standardized, the product of each manufacturer having a different number of anti-toxin units to the cubic c.

b. "CATTLE POISONING BY NITRATE OF SODA."

Nitrate of soda was used on a farm as a fertilizer for tobacco plants, and some of the cows happened to get access to a bag standing in an open shed and relished it as if it was coarse salt. Soon symptoms of brain lesions were in evidence, great irritation of mucous membranes, etc. A number died; some were relieved by antidotes and physics.

Dr. Wehr says whenever he makes a hypodermic injection of digitalin he is sure to have formation of an abscess at the point of injection. It was suggested that he use digitalin in conjunction with some other drug and no abscess would result.

The following cases were brought up and discussed by the members: Impaction of Rumen in Cattle, Congestion of the Brain in Horse, Diphtheria in Fowls, Scours in Calves, Retention of Placenta and Prolapse Uteri in Cow.

A motion was made to adjourn at 8.30 p. m., to meet June the 15th, 1910, in Reading.

W. G. HUYETT, Secretary.

MASSACHUSETTS VETERINARY ASSOCIATION.
(Last Three Meetings.)

The regular monthly meeting of the association was held at Young's Hotel, Boston, Wednesday evening, October 27, 1909. The attendance was small but those present no doubt felt repaid for coming, as they were treated to an interesting account

of the doings of the International Veterinary Congress at The Hague, in September.

Dr. Austin Peters, who had attended the congress, told of the doings and events of the several days of the session in a manner that interested every one.

The following resolutions on the death of Dr. Leonard Pearson were drawn up and adopted by the association:

Whereas, The Massachusetts Veterinary Association has learned of the death, September 20th last, of an honored and able member of the veterinary profession, Dr. Leonard Pearson,

Resolved, That this association deplores his death as a great loss to the veterinary profession, the scientific world and humanity; be it further,

Resolved, That these resolutions be entered upon the records of this association and that a copy, together with the sympathy and condolence of the Massachusetts Veterinary Association be sent to the members of his bereaved family.

Signed: AUSTIN PETERS, M.R.C.V.S.,
 DANIEL EMERSON, M.D.V.,
 FRANCIS ABELE, JR., V.S.

The association held its regular monthly meeting for November at Young's Hotel, Boston, Wednesday evening, November 24, 1909.

There was but a small amount of business to come before the meeting so the time was mostly occupied by a discussion of the two following questions propounded by one of the members:

First—How do treatments for mastitis or mammitis in the cow, by injections into the udder, compare in success with treatments by the mouth?

Second—How do the results from some of the newer proprietary medicines compare with firing and tenotomy for spavins?

The December meeting of the association, held Wednesday evening, December 22, 1909, brought out a very satisfactory number of members considering the date was so near that of our greatest holiday.

No special business coming before the members a general discussion on most timely topics was indulged in; the most interesting, perhaps, being Dr. Winchester's description of the new intradermic injection of tuberculin in cattle as a diagnosis of tuberculosis. This work being reported as that of a German investigator.

As usual a further discussion on that many-sided question, tuberculosis, was gone into at some length.

W. T. WHITE, Secretary.

GEORGIA STATE BOARD OF VETERINARY EXAMINERS.

The Georgia State Board of Veterinary Examiners held their second annual meeting at the State Capital in Atlanta, on December 22, 1909. Drs. C. R. Jolly, T. E. Jago, J. C. Schwencke and Peter F. Bahnsen answered the roll-call. A telegram from Dr. John R. Anderson notified the Board that he was unable to attend the meeting.

Dr. J. C. Schwencke, the retiring secretary, presented the resignation of Dr. M. A. Morris as a member of this board which, after due consideration was accepted and notice issued to the Georgia State Veterinary Association that a vacancy existed, asking them to endorse some one for the position, subject to the approval of and appointment by his Excellency the Governor.

After inspecting the examination papers for this term, prepared by Dr. Peter F. Bahnsen, the board opened the session for examination. Twelve applicants appeared before the board, either in person or by properly prepared and duly accredited application. Of these the following five were granted license to practice:

- Dr. L. L. Cheney, Augusta. University of Pennsylvania.
- Dr. E. J. Cramer, Atlanta. American Veterinary College.
- J. J. Culp, Ionia, Mich. Ontario Veterinary College.
- S. Mathers, Cordele, Ga. Ontario Veterinary College.
- E. G. Case, Savannah, Ga. Ontario Veterinary College.

The other seven applicants were rejected on account of insufficient credentials and inability to pass the examination. Four of these presented "Lamb-skins" from veterinary correspondence schools and one claimed to hail from the University Veterinary College of Kansas. Only the colleges accredited by the Bureau of Animal Industry, U. S. Department of Agriculture, are recognized by this board.

At the conclusion of the examinations the board went into executive session. Dr. Schwencke, whose term expired, was

thanked for his faithful and efficient service as secretary. The following were elected officers for the ensuing term: Dr. T. E. Jago, of Athens, President; Dr. John R. Anderson, of Macon, Vice-President, and Dr. Peter F. Bahnsen, of Americus, Secretary.

Meeting adjourned.

PETER F. BAHNSEN,
Secretary.

B. A. I. VETERINARY INSPECTORS' ASSOCIATION OF CHICAGO.

CHICAGO, ILL., January 21, 1910.

The regular monthly meeting of the B. A. I. Veterinary Inspectors' Association was held Friday evening, January 14, 1910.

It was regularly moved and seconded that the annual banquet be held on Saturday, March 12.

The paper of the evening was read by Dr. McKenzie, entitled, "Intensifying and Simplifying Medical Knowledge."

On motion by Dr. H. D. Paxson a committee was appointed to draft resolutions on the deaths of Dr. Potratz and Major John B. Sine.

Whereas, In His divine wisdom our Heavenly Father has deemed it expedient to transfer our fellow worker and esteemed friend, Dr. H. F. Potratz, into His spiritual kingdom, and,

Whereas, we, his fellow members of the B. A. I. Veterinary Inspectors' Association, feel deeply his removal from our midst and desire to give expression to the same. Therefore, be it

Resolved, That we extend our heartfelt sympathy to Mrs. Potratz and her infant daughter who are left to mourn a loving and devoted husband and a kind and affectionate father, his colleagues a faithful friend and congenial companion, and the Bureau of Animal Industry a capable and efficient servant.

Whereas, The Great Artificer of the Universe in His infinite wisdom has summoned our honored friend and co-worker, Major John B. Sine, to a higher sphere of usefulness in the spirit land, we, his fellow members of the B. A. I. Veterinary Inspectors' Association desire to give expression to our great sorrow at his demise. Therefore, be it

Resolved, That we express to Mrs. Sine our profound sympathy in this the hour of her great sorrow, and the hope that she may have that fortitude which comes from an abiding faith in the promise of a happy reunion in the great beyond. In his death his colleagues mourn the loss of a kind and congenial companion and friend; the Bureau of Animal Industry a capable and efficient officer, and his country a brave and distinguished patriot.

Drafts of these resolutions have been ordered placed on the records of this Association and an engrossed copy be sent to the family of the deceased members.

JAMES JOHNSTON,
L. ENOS DAY,
A. A. HOLCOMBE,
Committee.

D. D. TIERNEY, *Secretary.*

LO, THE HORSE.

In the midst of the present extravaganza of automobile and aeroplane racing it is refreshing to take notice, occasionally, of the horse. Witness the feat of an Illinois horse who belongs to a mail carrier. He has traveled twenty-six miles a day for twenty-two months, or a total of over 17,000 miles.

It is impressive to note that in all this distance this horse did not puncture a tire, lose a bolt, wear out a bearing, foul a spark plug or run out of gasoline ten miles from home. Moreover, he did not once exceed a speed limit, run over a hog, or skid on a corner.

His chauffeur never killed his engine on a hill, nor did he have to get out after an hour or two and crank him from in front. The horse climbed every hill, and pulled through every mudhole, and at the end of the 17,000 miles his owner did not find that it would cost about \$100 to replace his bearings, rebuild his magneto, and take the carbon out of his cylinders.

Truly, the horse may be humble, but there is much comfort in him.—*Aurora Beacon.*

CALIFORNIA, SEPTEMBER 6-7-8-9, 1910.

NEWS AND ITEMS.

THE annual meeting of the New York State Agricultural Society was held in Albany, January 18, 19, 20.

PROF. LIAUTARD has recently been elected Vice-President of the Societe Centrale de Medicine Veterinaire of Paris. The veterinary profession of both continents rejoice in this added honor.

DR. WALTER R. PICK, First Cavalry, who sailed with his regiment from Manila, P. I., January 15, for the States, will reach Walla Walla, Wash., about the 20th of this month, instead of Des Moines, Iowa, as he at first expected.

GOVERNOR WARNER, of Michigan, has recently appointed Dr. S. Brenton, of Detroit, a member of the State Board of Veterinary Examiners. In congratulating Dr. Brenton and the State of Michigan, we voice the sentiment of the entire veterinary profession of America.

KEYSTONE VETERINARY MEDICAL ASSOCIATION DINNER—On Tuesday evening, January 18, the Keystone Veterinary Medical Association gave a dinner in honor of Dr. S. H. Gilliland, recently appointed State Veterinarian of Pennsylvania, and Dr. Louis A. Klein, *more* recently appointed Dean of the University of Pennsylvania Veterinary School. Alumni Hall, in which the dinner was given, was tastefully decorated with the American flag and the U. of P. colors. Dr. W. L. Rhoads, of Lansdowne, Pa., was master of ceremonies. Dr. John W. Adams, of the veterinary school, in the capacity of toastmaster, added much to the pleasure of the occasion by the wit with which he interspersed his introductions. Between seventy-five and eighty members of the Keystone Association, and their guests, sat at the festive board; New York, New Jersey, Pennsylvania and Delaware being represented. Among the distinguished guests were Senator N. B. Critchfield, Secretary of Agriculture, of Pennsylvania, and Hon. Edgar F. Smith, Vice Provost of the University of Pennsylvania. Toasts were responded to in the following order, and each speaker took occasion to express his earnest approval of the ap-

pointment of the two estimable gentlemen in whose honor the dinner was given. "The Keystone Veterinary Medical Association," W. Horace Hoskins; "Stock Raising," Senator N. B. Critchfield; "The Veterinary School," John Marshall; "The Outlook," Robert W. Ellis; "The University and the State," Vice Provost Edgar F. Smith; "The Veterinary Faculty," Louis A. Klein; "Veterinary Sanitation," S. H. Gilliland. The recognition of merit which characterized these two appointments and the undoubted good that will result from them is gratifying.

DOVER, DEL., January 24, 1910.

Editors AMERICAN VETERINARY REVIEW.

DEAR SIRs—Enclosed find my check for (1910) REVIEW; couldn't do without it; just as necessary as my vet. books, and always save it from year to year for occasional reference.

Yours very truly,

J. R. KUHUS, V.S.

JEWELL CITY, KAN., December 24, 1909.

Editors AMERICAN VETERINARY REVIEW, New York.

DEAR SIRs—Enclosed please find personal check for \$3.00, for which push my subscription ahead one year. I would rather think of being without a place to sleep than to dispense with the REVIEW.

Respectfully yours,

H. R. GROOME.

FOR CAB HORSES' COMFORT.—The cab horse has to eat while at work. That is, while waiting on duty. The stifling nosebag is objectionable. A policeman in Berlin, Germany, Herr Christoph Reimer, has invented what the cabmen call the right thing. The food bag is attached to the shafts of the vehicle by means of two iron rods bent at the proper angle, and the horse can eat his oats or other grain without having to put his head down to the ground. A cabman in Friedrichstrasse said: "This food bag certainly has its advantages. Some horses continually throw their oats out by shaking their heads, but the new scheme will prevent that. Furthermore, when using the ordinary nosebag, a cabman is obliged frequently to change the lengths of the reins and straps in order to make it possible for his horse to reach his food. This will not be necessary with the new invention."—*World's Chronicle.*

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alumni Ass'n, N. Y.-A. V. C.....	.....	141 W. 54th St.	L. L. Glynn, N. Y. City.
American V. M. Ass'n.....	Sept. 6, 7, 8, 9,-10	San Francisco.	R. P. Lyman, Kansas City, Mo.
Arkansas Veterinary Ass'n.....	.....	.....	Horace E. Rice, Little Rock.
Ass'n Médécalle Veterinaire Fran- caise "Laval".....	1st and 3d Thur. of each month	Lec. Room, La- val Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	2d Fri. ea. mo...	Chicago.....	D. D. Tierney, Chicago, Ill.
California State V. M. Ass'n.....	.....	San Francisco.	J. J. Hogarty, Oakland.
Central Canada V. Ass'n.....	.....	Ottawa.....	A. E. James, Ottawa.
Chicago Veterinary Society.....	2d Tues. ea. mo.	Chicago.....	J. M. Parks, Chicago.
Colorado State V. M. Ass'n.....	.....	Denver.....	M. J. Woodliffe, Denver.
Connecticut V. M. Ass'n.....	February 1, 1910.	Hartford.....	B. K. Dow, Williamantic.
Genesee Valley V. M. Ass'n.....	.....	.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.....	.....	.....	P. F. Bahnsen, Americus.
Hamilton Co. (Ohio) V. A.....	.....	.....	Louis P. Cook, Cincinnati.
Illinois State V. M. Ass'n.....	.....	.....	J. H. Crawford, Harvard.
Illinois V. M. and Surg. A.....	Jan. and Aug...	Louisville....	W. A. Swain, Mt. Pulaski.
Indiana Veterinary Association...	.....	.....	E. M. Bronson, Indianapolis
Iowa Veterinary Ass'n.....	Feb. 15, 16, 17, 1910	Des Moines...	H. C. Simpson, Denison.
Kansas State V. M. Ass'n.....	.....	.....	B. Rogers, Manhattan.
Kentucky V. M. Ass'n.....	.....	Not decided	D. A. Piatt, Lexington.
Keystone V. M. Ass'n.....	Monthly.....	Philadelphia..	S. Lockett, Glenolden.
Louisiana State V. M. Ass'n.....	.....	.....	E. F. Flower, Baton Rouge.
Maine Vet. Med. Ass'n.....	.....	.....	A. Joly, Waterville.
Maryland State Vet. Society.....	.....	Baltimore....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.....	Monthly.....	Boston.....	Wm. T. White, Newtonville.
Michigan State V. M. Ass'n.....	.....	.....	Judson Black, Richmond.
Minnesota State V. M. Ass'n.....	.....	.....	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.....	.....	.....	J. C. Robert, Agricultural Col.
Missouri Valley V. Ass'n.....	Feb. 2-3, 1910...	Kansas City..	B. F. Kaupp, Fort Collins, Colo.
Missouri Vet. Med. Ass'n.....	.....	St. Joseph....	F. F. Brown, Kansas City.
Montana State V. M. A.....	.....	Helena.....	W. S. Swank, Miles City.
Nebraska V. M. Ass'n.....	.....	Grand Island.	H. Jensen, Weeping Water.
New York S. V. M. Soc'y.....	.....	Ithaca.....	J. F. De Vine, Goshen.
North Carolina V. M. Ass'n.....	.....	Wilmington...	Adam Fisher, Charlotte.
North Dakota V. M. Ass'n.....	Call of Sec'y...	Fargo.....	C. H. Martin, Valley City.
Ohio State V. M. Ass'n.....	.....	.....	Sidney D. Myers, Wilmington
Ohio Soc. of Comparative Med..	Annually.....	Up'r Sandusky	F. F. Sheets, Van Wert, Ohio.
Oklahoma V. M. Ass'n.....	.....	.....	R. A. Phillips, Oklahoma City
Ontario Vet. Ass'n.....	.....	.....	C. H. Sweetapple, Toronto.
Passaic Co. V. M. Ass'n.....	Call of Chair..	Paterson, N. J.	H. K. Berry, Paterson, N. J.
Pennsylvania State V. M. A.....	Mar. 8-9, 1910...	Philadelphia..	F. H. Schneider, Philadelphia.
Philippine V. M. A.....	.....	.....	Chas. G. Thomson, Manila.
Province of Quebec V. M. A.....	.....	Mon. and Que.	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.....	Jan. and June..	Providence...	J. S. Pollard, Providence
St. Louis Soc. of Vet. Inspectors.	1st Wed. fol. the 2d Sun. ea. mo.	St. Louis.....	Wm. T. Conway, St. Louis, Mo
Schuylkill Valley V. M. A.....	June 15, 1910...	Reading.....	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn....	.....	Philadelphia..	B. T. Woodward, Wash'n, D. C.
South Dakota V. M. A.....	July, 1910.....	Sioux Falls...	J. A. Graham, Sioux Falls.
Southern Auxiliary of California State V. M. Ass'n.....	Jan. Apl. Jy. Oct.	Los Angeles...	J. A. Edmonds, Los Angeles.
So. St. Joseph Ass'n of Vet. Insp.	4th Tues. ea. mo.	407 Ill. Ave...	H. R. Collins, So. St. Joseph.
Tennessee Vet. Med. Ass'n.....	.....	.....	A. C. Topmiller, Murfreesboro
Texas V. M. Ass'n.....	Call Exec. Com.	.....	R. P. Marsteller, College Sta.
Twin City V. M. Ass'n.....	2d Thu. ea. mo.	St. P.-Minneap	S. H. Ward, St. Paul, Minn.
Vermont Vet. Med. Ass'n.....	.....	.....	F. W. Chamberlain, Burlington
Veterinary Ass'n of Alberta....	.....	.....	C. H. H. Sweetapple, For.
Vet. Ass'n Dist. of Columbia....	3d Wed. ea. mo..	514-9th St., N. W.....	Saskatchewan, Alta., Can.
Vet. Ass'n of Manitoba.....	Not stated.....	Winnipeg.....	M. Page Smith, Wash., D. C.
Vet. Med. Ass'n of N. J.....	.....	.....	F. Torrance, Winnipeg.
V. M. Ass'n, New York City.....	1st Wed. ea. mo.	141 W. 54th St.	W. Herbert Lowe, Paterson.
Veterinary Practitioners' Club...	Monthly.....	Jersey City...	W. Reid Blair, N. Y. City.
Virginia State V. M. Ass'n.....	.....	.....	A. F. Mount, Jersey City.
Washington State Col. V. M. A...	1st & 3d Fri. Eve.	Pullman.....	W. G. Chrisman, Charlo'sv'le.
Washington State V. M. A.....	.....	Seattle.....	R. G. McAlister, Pullman.
Western Penn. V. M. Ass'n.....	1st Wed. ea. mo.	Pittsburgh...	J. T. Seely, Seattle.
Wisconsin Soc. Vet. Grad.....	.....	Grand Rapids.	F. Weitzell, Allegheny.
York Co. (Pa.) V. M. A.....	J. P. West, Madison.
			E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

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THIS is the season of the year when your clients will begin to discuss horse breeding with you; and if they have a mare they have not been able to get in foal on previous occasions, they will want your advice in regard to her. If, on examination, you believe mechanical assistance is what she requires, you will at once think of CRITTENDEN & Co., of Cleveland, Ohio, as the firm that has all the up-to-date impregnators and other breeding specialties; stallion and jack supplies, etc. If you need any of their goods you will find their address on the opposite page, lower left-hand corner.

As the spring approaches, skin diseases will begin to manifest themselves in the dogs. The Hoffmann-LaRoche Chemical Co. will furnish a free sample of Thigenol "Roche" if you desire to test their product. so fully are they assured that it will prove its efficiency to you. (Literature will accompany the package.)

Do not hesitate to urge your clients to use the AIR-CUSHION PADS on their driving and business horses. They are an essential on asphalt pavements summer and winter. See description on page 22 (adv. dept.).

THE condition of the roads during the winter season is bound to run the work-horses down in flesh. Nothing will pick them up so satisfactorily as ATLAS HORSE FEED. Give this splendid molasses feed a little thought. If you desire to know more of its composition, write THE MEADER-ATLAS Co. You will find their address when you need it on page 3 (adv. dept.).

THIS is the season of the year when veterinarians appreciate the joys and conveniences of a horse ambulance, and the discouraging wearing ordeal of standing on a street corner looking at a patient perishing on the ice-covered pavement, in the absence of such a convenience. The Rech-Marbaker Co., of Philadelphia, show a cut of the best horse ambulance made, on page 7 (adv. dept.).